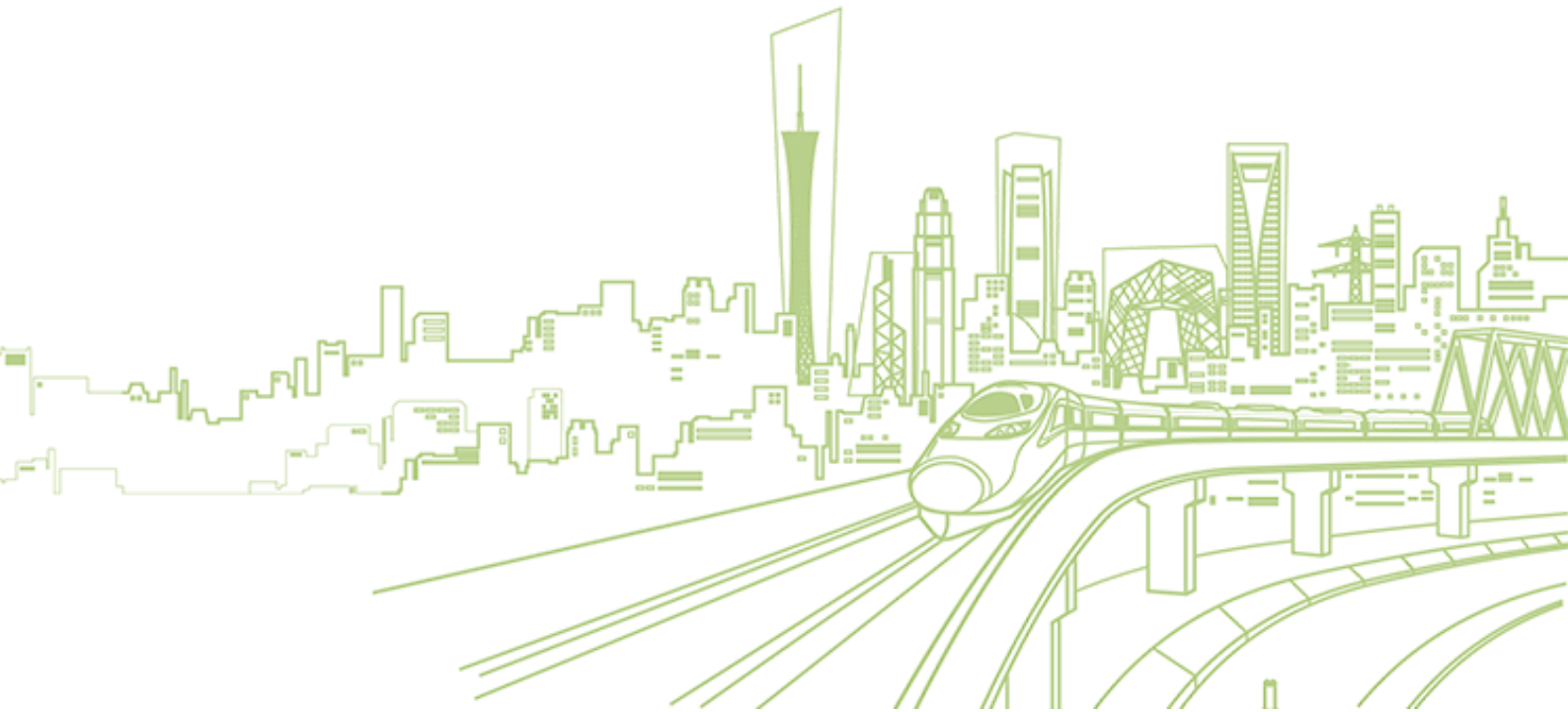
THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

National Rail Transit Electrification and Automation Engineering Technology Research Center (Hong Kong Branch)
國家軌道交通電氣化與自動化工程技術研究中心 (香港分中心)

2019

Annual Report

National Rail Transit Electrification and Automation
Engineering Technology Research Centre (Hong Kong Branch)



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Director's Foreword

Upon the opening of Guangzhou-Shenzhen-Hong Kong High Speed Rail (HSR) Hong Kong Section, the bindings between cities in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) become closer, promoting interactions and communications of products, service, human resource and information within the area. The new phenomena well demonstrate the important role that HSR plays in modern rail transit network, and in the meantime officially mark the commencing of "Age of HSR" in Hong Kong as in other cities in the Chinese Mainland.

In the first half of 2019, according to the Government's report in the National People's Congress and the Chinese Political Consultative Conference, the central government's investment on national railway construction remains beyond 800 billion. It has been several consecutive years the investment amount goes beyond 800 billion, showing the country's top focus on construction of railway systems, especially for HSR systems in the GBA area. With the establishment of "The development plan for Guangdong-Hong Kong-Macao Greater Bay Area", the Hong Kong Branch of the National Rail Transit Electrification and Automation Engineering Technology Research Center (CNERC-Rail) deploys according to the Development Plan, and actively participates in the development scheme of the GBA area, through strengthening collaborations between government departments, universities and enterprises within the area. Over the past year, the CNERC-Rail together with other universities in the GBA area have successfully organized conferences including "The First Workshop on Guangdong-Hong Kong-Macao Greater Bay Area Maglev and Advanced Transit Development" and "2019 Annual Meeting of the Guangdong-Hong Kong-Macau Greater Bay Area Rail Transit Joint Innovation Union", and have jointly applied research projects including Guangdong key program on fundamental science and applications, Guangdong international science and technology collaborative project, etc. The CNERC-Rail has also conducted multiple engineering projects such as Guangzhou-Shantou HSR construction project, Guangzhou metro noise and vibration control project, in collaboration with China Railway Guangzhou

Group Co., Ltd., Guangzhou Metro Co., Ltd., and China Railway Guangzhou Engineering Group Co., Ltd. in the GBA area.

Over the past year of 2019, the CNERC-Rail has obtained many achievements in the rail transit sector. Not only fruitful deliverables and great breakthrough have been realized in the research area, but also long-term partnership has been established and agreements signed with world-leading universities, research institutes and enterprises in terms of academic communication and collaborations, aiming at resource sharing and win-win outcomes by taking advantages of both sides.

In the aspect of research, the CNERC-Rail has applied a series of research projects including key program from National Natural Science Foundation of China (NSFC), theme-based research project from Research Grant Council (RGC) of the Hong Kong SAR Government, Guangdong key program on fundamental science and applications, Guangdong international collaborative project and mainland-Hong Kong collaborative project. Two key projects approved for funding (funding amount over 10 million HK dollars), and the theme-based project has passed the first round and the full proposal has been submitted.

In the aspect of academic communication and collaborations, the CNERC-Rail actively enlarge its impact and strengthen the partnership. The CNERC-Rail co-organized the most influencing conference “The Third China High Speed Railway Health Management Technology Forum” in the railway sector in China, and organized multiple special sessions on HSR monitoring in international conferences. The CNERC-Rail has signed agreements/MoUs with the Qingdao West Coast New Area government, the National Maglev Transportation Technology Research Centre at Tongji University, and the Technical University of Dresden, Germany, and the Guangzhou Metro Group Co., Ltd. Moreover, the CNERC-Rail has conducted multi-level communication and visiting activities with different universities and enterprises. In 2019, Centre members have visited Hunan Maglev Transportation Development Co., Ltd., CRRC Zhuzhou Locomotive Co., Ltd., China Academy of Railway Sciences, and CRRC Qingdao Sifang Co., Ltd. and other railway research institutions for academic communication and technical collaborations. Meanwhile, the CNERC-Rail has invited many professors from famous universities such as Massachusetts Institute of Technology, University of Birmingham, the University of

Southern California. We also warmly welcomed delegations from different authorities such as the Electrical and Mechanical Services Department (EMSD) of the Hong Kong SAR government, the China Science Technology Exchange Centre (CSTEC) of the Ministry of Science and Technology of China.

Lastly, I would like to express my special gratitude to the Ministry of Science and Technology of China, the Innovation and Technology Commission (ITC) of the Hong Kong SAR Government and the Hong Kong Polytechnic University (PolyU) for their great support to the Centre's work. In the coming new year, the Centre members will fully summarize the work and experience in 2019 and make substantial improvements in 2020.

Yi-Qing Ni Chair Professor
Director
National Rail Transit Electrification and Automation Engineering Technology Research Centre (CNERC-Rail)
Hong Kong Branch

Overview of CNERC-Rail 2019

Introduction

The National Rail Transit Electrification and Automation Engineering Technology Research Centre (CNERC-Rail) Hong Kong Branch is established in 2015 approved by the Ministry of Science and Technology of the People's Republic of China, with funding support from the Innovation and Technology Commission (ITC) of the Hong Kong SAR Government and the Hong Kong Polytechnic University for operation and researching. Affiliated to the Hong Kong Polytechnic University (PolyU), the CNERC-Rail builds up an interdisciplinary research team taking advantage of advanced sensing, smart materials and data-driven analysis techniques and incorporating the research resources from the university.

Mission: To develop state-of-the-art monitoring technologies embracing smart materials and advanced big data analysis methods for rail transit system.

Vision: To accelerate the process of constructing intelligent rail transit including high-speed rail, metro and maglev systems concerning safety and reliability, promoting innovative monitoring technologies for rail transit from Hong Kong to Asia and worldwide.

In 2019, the CNERC-Rail has made remarkable progress in applying for key research funding projects, conducting engineering projects, organizing international conferences and enhancing collaborative relationships. The CNERC-Rail's work in 2019 is elaborated in detail in the following sections.

Research Team

The CNERC-Rail research team consists of 13 key members. To ensure efficient operation and management of the R&D projects, the CNERC-Rail also encourages and supports collaborative members from different faculties in their participation of R&D projects, and recruits research staff from worldwide.

Table 1. 1 Key members of CNERC-Rail

No.	Name and Position	Department	Remark
1	Yi-Qing Ni, Chair Professor	Department of Civil and Environmental Engineering	Director
2	Kang-Kuen Lee, Professor	Department of Electrical Engineering	Deputy Director
3	Siu-Lau Ho, Chair Professor	Department of Electrical Engineering	Project Leader
4	Hwa-Yaw Tam, Chair Professor	Department of Electrical Engineering	Project Leader
5	Li Cheng, Chair Professor	Department of Mechanical Engineering	Project Leader
6	Jian-Nong Cao, Chair Professor	Department of Computing	Project Leader
7	Xiao-Li Ding, Chair Professor	Department of Land Surveying and Geo-informatics	Project Leader
8	Ka-Wai Cheng, Professor	Department of Electrical Engineering	Project Leader
9	Siu-Wing Or, Professor	Department of Electrical Engineering	Project Leader
10	Zhong-Qing Su, Professor	Department of Mechanical Engineering	Project Leader
11	Songye Zhu, Associate Professor	Department of Civil and Environmental Engineering	Secretary
12	Dan Wang, Associate Professor	Department of Computing	Project Leader
13	Xing-Jian Jing, Associate Professor	Department of Mechanical Engineering	Project Leader

Table 1. 2 Collaborative members of CNERC-Rail

No.	Name and Title	Department	Remark
1	Hung-Lin Chi, Assistant Professor	Department of Building and Real Estate	Project Leader
2	Xu-Sheng Yang, Assistant Professor	Department of Industrial and Systems Engineering	Project Leader
3	Siu-Kai Lai, Assistant Professor	Department of Civil and Environmental Engineering	Project Leader

Table 1. 3 Recruited staff of CNERC-Rail 2019

No.	Name and Title	Position	Period of Employment	
1	Zu-Guang Ying	Senior Research Fellow	2019/6/10	2019/8/9
2	Lu Zhou	Research Fellow	2018/5/19	2019/3/31
		Research Assistant Professor	2019/4/1	2022/3/31
3	Yun-Lai Zhou	Research Fellow	2018/11/1	2019/6/6
4	Jin Guo	Research Fellow	2019/1/25	2020/3/24
5	Ruo-Lin Wang	Research Fellow	2019/6/11	2019/9/10
6	Cui-Dong Xu	Research Fellow	2019/9/16	2020/6/30
7	Xiang-Yang Xu	Research Fellow	2019/10/30	2020/10/29
8	Hua-Ping Wan	Postdoctoral Fellow	2017/1/7	2019/1/16
9	You-Wu Wang	Postdoctoral Fellow	2017/12/7	2020/6/6
10	Xiao-Zhou Liu	Postdoctoral Fellow	2018/7/26	2020/1/25
11	Su-Mei Wang	Research Associate	2018/9/10	2019/3/31
		Postdoctoral Fellow	2019/4/1	2020/3/31
12	Xiang-Yun Deng	Postdoctoral Fellow	2019/9/25	2020/9/24
13	Cai-Ling Fu	Postdoctoral Fellow	2019/10/03	2020/10/2
14	Ying-Kin Leung	Research Associate	2017/3/13	2019/1/20
15	Xiao-Le Luan	Research Associate	2018/11/15	2019/8/14
16	Seyed Masoud Sajjadi Alehashem	Research Associate	2019/2/27	2020/2/26
17	Yiu-Lun Ho	Research Associate	2019/8/1	2019/8/25
18	Chih-Shiuan Lin	Research Associate	2019/6/6	2019/11/30
19	Xiang Xu	Research Associate	2019/9/2	2019/12/1
20	Yee-Yan Chan	Research Associate	2019/9/9	2020/9/8

21	Chao Zhang	Research Assistant	2015/12/17	2020/2/16
22	Liu Jiang	Research Assistant	2018/8/1	2019/1/31
23	Yan-Jie Zhu	Research Associate	2019/1/8	2019/7/11
		Postdoctoral Fellow	2019/7/12	2019/8/23
24	Yang Lu	Research Assistant	2018/10/2	2020/3/31
25	Gao-Qiang Kang	Research Assistant	2019/7/16	2020/1/15
26	Ran Chen	Research Assistant	2018/10/25	2019/10/23
27	Qiu-Hu Zhang	Research Assistant	2019/9/5	2020/3/4
28	Si-Qi Ding	Research Assistant	2019/9/6	2020/3/5
29	Chi-Fai Cheung	Research Technical Assistant	2018/11/2	2019/5/1
30	Tai-Tung Wai	Research Technical Assistant	2017/1/23	2021/1/22
31	Wing-Hong Kwan	Research Technical Assistant	2017/10/4	2021/3/31
32	Zi-Xin Su	Research Technical Assistant	2019/8/20	2020/2/19
33	Hai-Qiu Lin	Assistant Officer	2017/7/2	2019/9/23
34	Kai-Zhen Liu	Research Assistant	2019/9/2	2020/2/28
35	Qian-Cheng Wang	Research Assistant	2019/10/2	2020/1/31
36	Wan-Ting Sun	Research Associate	2019/9/2	2020/8/30
37	Yan-Peng Wang	Postdoctoral Fellow	2019/6/11	2020/6/10
38	Lo-Long Yin	Research Assistant	2019/6/20	2020/6/19
39	Shen-Bo Shan	Research Associate	2019/7/8	2020/7/7
40	Yang Liu	Research Assistant	2019/7/21	2020/7/20
41	Wen-Zheng Xu	Research Assistant	2019/7/22	2020/3/31

42	Chi-Ho Chan	Research Assistant	2019/12/2	2020/1/31
43	Wai-Kin Lau	Research Assistant	2019/12/2	2020/12/1

Financial Report

In 2019, the financial breakdown is displayed as follows:

1. Income: 13,750,000 (Unit: HKD)

- ITC Funding $8,750,000*
- PolyU Funding $5,000,000

* Starting from the financial year of 2019/20 (April 2019), the funding from ITC has been increased from HK$5,000,000 to HK$10,000,000

2. Expenditure: 13,750,000 (Unit: HKD)

- Research Projects $4,670,000
- Human Resource $3,110,000
- Equipment Purchase $5,690,000
- General Expenses $280,000

R&D Activities of CNERC-Rail 2019

Research Projects

Applied Research Grants

In 2019, the CNERC-Rail has applied/jointly applied 11 research grants, among which 5 projects have successfully been approved for funding with the total funding amount of over 8 million HKD and more than 3 million RMB, and the rest 6 projects are pending for approval or waiting for oral defense. The funding schemes include theme-based research scheme from Research Grants Council (RGC) of the Hong Kong SAR Government, key program from National Natural Science Foundation of China (NSFC), research and development project from the China State Railway Group Company, Ltd., Guangdong key program on fundamental science and applications, and various international/Hong Kong-Macau-Taiwan collaborative projects. Detailed project information is shown in Table 2. 1.

Table 2. 1 Applied Research Grants in 2019

No.	Title	Funding Source	Amount	Status
1	Enhancing safety, punctuality and ride comfort of railway transportation: From local metro system to global high-speed rail network	Hong Kong Research Grants Council the Research Impact Fund (RIF) for 2018/19	HKD 8,430,000	Approved
2	Basic theory and key technology of intelligent operation and maintenance of high-speed railway bridges	HSR Collaborative Funding, National Natural Science Foundation of China	RMB 2,310,000	Approved
3	Key technology research on long-span segment of precast concrete cable stayed bridge in Guangshan HSR	Science and Technology Research and Development Project, the China State Railway Group Company	RMB 500,000	Approved

4	Smart rail transit systems and applications	Sanmen Science and Technology Bureau	RMB 600,000	Approved
5	Trackside acoustic detection method for train axle bearing faults	Sichuan International/Hong Kong-Macau-Taiwan Science and Technology Collaborative Project	RMB 500,000	Approved
6	Intelligent Monitoring Platform and Key Technologies of Maglev Vehicle-Suspension-Guideway Coupling System	Innovation and Technology Fund 2019- Mainland-Hong Kong Joint Funding Scheme	HKD 3,000,000 + RMB 3,000,000	Hong Kong oral defense completed, waiting for mainland oral defense
7	Structural Performance Evolution and Catastrophic Behavior of Long-span Bridges in Subtropical Coastal Service Environment	Guangdong Key Program on Fundamental Science and Applications	RMB 50,000,000	Pending
8	Development and application of new structure damping device based on inerter	International Science and Technology Collaborative Project, Department of Science and Technology of Guangdong	RMB 990,000	Pending
9	Transformative tropical storm risk mitigation of high-rise building clusters in coastal cities through understanding urban aerodynamics mechanism	Hong Kong Research Grants Council Theme-based Research Scheme 2020/21 (Tenth Round)	HKD 50,000,000	Shortlisted and invited for full proposal submission
10	Track geometric condition monitoring system based on machine vision	Hong Kong-Macau Collaborative Research Fund, Wuyi University	RMB 500,000	Pending

11	Research on the key aerodynamic detection technologies in multi-field coupled for ultra-high-speed maglev vehicles	Hong Kong-Macau Collaborative Research Fund, Wuyi University	RMB 500,000	Pending

Established Research Projects

The CNERC-Rail has established 9 research projects with 9 academic staff from 5 difference departments serving as the principal investigator Table 2. 2.

Table 2. 2 CNERC-Rail Established Research Projects in 2019

No.	Title	Principal Investigator	Department	Start-End Date
1	The development of BIM-AR health monitoring system for high-speed railway infrastructure management	Hung-Lin Chi	Department of Building and Real Estate	2019.06.01-2020.02.28
2	Surface hardening for railway turnout frog made manganese steels	Xu-Sheng Yang	Department of Industrial and Systems Engineering	2019.07.04-2021.07.03
3	Development of fibre-optic distributed acoustic sensing system for railway infrastructure condition monitoring	Hwa-Yaw Tam	Department of Electrical Engineering	2019.04.01-2021-03.30
4	Guided wave propagation in both plane and cylindrical structures with applications to crack detection in train axles	Li Cheng	Department of Mechanical Engineering	2019.05.01-2020.12.30

5	Self-powered train suspension using smart dampers	Songye Zhu	Department of Civil and Environmental Engineering	2019.07.01-2021.01.30
6	Electro-/magneto-/mechano-active smart materials and devices for emerging sensing, absorption, and storage in railway electrification systems	Siu-Wing Or	Department of Electrical Engineering	2019.07.15-2021.01.14
7	Advanced control strategy bidirectional converters for efficient and low-harmonic power conversion in railway electrification	Siu-Wing Or Siu-Lau Ho	Department of Electrical Engineering	2019.07.15-2021.01.14
8	Electromagnetic interference for railway system and its EMC signature	Ka-Wai Cheng	Department of Electrical Engineering	2019.07.01-2020.06.30
9	Advanced online monitoring and detection technology for wheel defects	Siu-Kai Lai	Department of Civil and Environmental Engineering	2019.07.01-2020.12.30

Engineering Projects

Structural Health Monitoring of Maglev Systems

To enhance safety and reliability of maglev rail transit, the CNERC-Rail signed an MoU with the National Maglev Transportation Technology Research Centre at Tongji University on the project on monitoring and testing of low-speed maglev rail and vibration coupling parameters of the suspension frame. The project aims at monitoring, mechanism study and control of the maglev train-suspension-track coupling system through theoretical investigations, numerical simulations, lab experimental studies and in-situ tests. Centre members have conducted 3 times in-situ tests in Changsha mid-/low-speed maglev lines and Shanghai Lingang mid-/low-speed maglev testing lines monitoring the maglev trains, levitation frames, tracks and bridges, as shown in Figure 2. 1 and Figure 2. 2.

Figure 2. 1 Monitoring of Changsha mid-/low-speed maglev line

Figure 2. 2 Monitoring of Shanghai Lingang mid-/low-speed maglev testing line

Research in Noise Reduction and Vibration Control of Guangzhou Metro Line

In 2019, the CNERC-Rail has signed an MoU with Guangzhou Metro Group Co. Ltd. and the National Engineering Laboratory for System Safety and Operation Assurance of Urban Rial Transit on “Applications of noise reduction and vibration control techniques on urban rail transit systems”. The collaboration content includes in-situ testing of noise and structural vibration level in carybody and rail tracks in tunnels and elevated bridges, and analysis of vibration and noise source; development and application of new rail dampers on rail corrugation mitigation in different area; identification of wheel out of roundness and relationship analysis between wheel surface roughness and structural vibration level of rail tracks and wheel-rail noise level; measurements of rail corrugation and its relationship with structural vibration level of rail tracks and wheel-rail noise level, etc. Centre Director Prof. Yi-Qing Ni, Dr. Xiao-Zhou Liu, Dr. Xiang-Yun Deng, Mr. Tai-Tung Wai and Mr. Wing-Hong Kwan went to Guangzhou Metro Co., Ltd. multiple times for technical collaborations and have conducted a series of monitoring tests on structural vibrations and noise of elevated rail tracks, as well as environmental noises.

Figure 2. 3 Monitoring, noise reduction and vibration control of Guangzhou metro line 4

Research in Noise Reduction and Vibration Control of Wenzhou Metro Line

Line S1 of the Wenzhou Metro is the first suburban rapid transit line in Wenzhou. The rail line adopts the elevated structure and has encountered severe noise problem since operation. The CNERC-Rail and China Railway Siyuan Survey and Design Group Co., Ltd. signed an MoU on “Comprehensive research on noise reduction and vibration control of Wenzhou elevated suburban metro lines”, proposing to implement noise reduction and vibration control segment in the elevated area of Line S1 of the Wenzhou Metro, to establish a comprehensive technical plan and practical example on noise reduction and vibration control considering various aspects of elevated lines (bridges, rail tracks and sound barriers), and to apply applications on Line S2 and S3. In 2019, Centre members Dr. Masoud Sajjadi, Mr. Chao Zhang, Mr. Yun-Ke Luo went to Wenzhou multiple times for technical discussion and in-situ testing.

Figure 2. 4 Monitoring, noise reduction and vibration control of Wenzhou metro

Research Outcomes

Publications

In 2019 the CNERC-Rail has published 41 papers including 23 journal papers and 18 international conference papers; Centre members have delivered 18 invited talks/keynote speeches in international conferences.

International Journal Publications

1. Wang, Y.W., and Ni, Y.Q. (2019), "Real-time defect detection of high-speed train wheels by using Bayesian forecasting and dynamic model", *Mechanical Systems and Signal Processing*, Vol. 139, Paper No. 106654. (SCI)
2. Wang, Y.W., and Ni, Y.Q. (2019), "Bayesian dynamic forecasting of structural strain response using structural health monitoring data", submitted to *Structural Control and Health Monitoring*. (SCI)
3. Ni, Y.Q., Wang, Y.W., and Zhang, C. (2019), "A Bayesian approach for condition assessment and damage alarm of bridge expansion joints using long-term SHM data", submitted to *Engineering Structures*. (SCI)
4. Wan, H.P., and Ni, Y.Q. (2019), "A new approach for interval dynamic analysis of train-bridge system based on Bayesian optimization", accepted to *Journal of Engineering Mechanics*, ASCE. (SCI)
5. Vatandoost, H., Sajjadi Alehashem, S.M., Norouzi, M., Taghavifar, H., and Ni, Y.Q. (2019), "A supervised artificial neural network-assisted modeling of magnetorheological elastomers in tension-compression mode", *IEEE Transactions on Magnetics*, Vol. 55, No. 12, Paper No. 2502008. (SCI)
6. Ni, Y.Q., Wang, Y.W., Liao, W.Y., and Chen, W.H. (2019), "A vision-based system for long-distance remote monitoring of dynamic displacement: experimental verification on a supertall structure", *Smart Structures and Systems*, Vol. 24, No. 6, 769-781. (SCI)
7. Wang, H.P., Ni, Y.Q., Dai, J.G., and Yuan, M.D. (2019), "Interfacial debonding detection of strengthened steel structures by using smart CFRP-FBG composites", *Smart Materials and Structures*, Vol. 28, No. 11, Paper No. 115001. (SCI)
8. Ni, Y.Q., Ding, S.Q., Han, B.G., and Wang, H.P. (2019), "Layer-by-layer assembly of polyelectrolytes-wrapped multi-walled carbon nanotubes on long period fiber grating sensors", *Sensors and Actuators B: Chemical*, Vol. 301, Paper No. 127120. (SCI)
9. Liu, X.Z., Xu, C., and Ni, Y.Q. (2019), "Wayside detection of wheel minor defects in high-speed trains by a Bayesian blind source separation method", *Sensors*, Vol. 19, No. 18, Paper No. 3981. (SCI)

10. Wang, C., Lai, S.K., Wang, Z.C., Wang, J.M., Yang, W., and Ni, Y.Q. (2019), "A low-frequency, broadband and tri-hybrid energy harvester with septuple-stable nonlinearity-enhanced mechanical frequency up-conversion mechanism for powering portable electronics", *Nano Energy*, Vol. 64, Paper No. 103943. (SCI)
11. Wang, Q.A., and Ni, Y.Q. (2019), "Measurement and forecasting of high-speed rail track slab deformation under uncertain SHM data using variational heteroscedastic Gaussian process", *Sensors*, Vol. 19, No. 15, Paper No. 3311. (SCI)
12. Ying, Z.G., Ni, Y.Q., and Duan, Y.F. (2019), "Stochastic stability control analysis of an inclined stay cable under random and periodic support motion excitations", *Smart Structures and Systems*, Vol. 23, No. 6, 641-651. (SCI)
13. Ying, Z.G., Ni, Y.Q., and Kang, L. (2019), "Parametrically excited stability of periodically supported beams under longitudinal harmonic excitations", *International Journal of Structural Stability and Dynamics*, Vol. 19, No. 9, Paper No. 1950095 (18 pages). (SCI)
14. Ying, Z.G., Ni, Y.Q., and Kang, L. (2019), "Modal localization characteristics of damaged quasi-periodically supported beam structures with local weak coupling", *Structural Control and Health Monitoring*, Vol. 26, No. 6, Paper No. e2351. (SCI)
15. Wan, H.P., and Ni, Y.Q. (2019), "An efficient approach for dynamic global sensitivity analysis of stochastic train-track-bridge system", *Mechanical Systems and Signal Processing*, Vol. 117, 843-861. (SCI)
16. Wu, J., Wu, C., Cao, S., Or, S.W., Deng, C., and Shao, X. (2019), "Degradation data-driven time-to-failure prognostics approach for rolling element bearings in electrical machines", *IEEE Transactions on Industrial Electronics*, Vol. 66, No. 1, 529-539. (SCI)
17. Chi, H.L., Thedja, J., Kim, M.K., and Seo, J. (2019), "Framework for automated formwork quality inspection system using laser scanning and augmented reality", submitted to *Advanced Engineering Informatics*. (SCI).
18. Shan, S., and Cheng, L. (2019), "Mixed third harmonic shear horizontal wave generation: interaction between primary shear horizontal wave and second harmonic lamb wave", *Smart Materials and Structures*, Vol. 28, Paper No. 085042. (SCI)
19. Shan, S., Hasanian, M., Cho, H., et al. (2019), "New nonlinear ultrasonic method for material characterization: Codirectional shear horizontal guided wave mixing in plate", *Ultrasonics*, Vol. 96, 64-74. (SCI)
20. Han, D., Chatterjee, A., Man, L.H., and Or, S.W. (2019), "In-situ arc discharge-derived FeSn2/Onion-like carbon nanocapsules as improved stannide-Based electrocatalytic anode materials for lithium-ion batteries", *Catalysts*, Vol. 9, No. 11, 950. (SCI)
21. Xu, W., Chan, K.W., Or, S.W., Ho, S.L., and Liu, M. (2019), "A low-harmonic control method of bi-directional three-phase z-source converters for vehicle-to-grid applications", submitted to *IEEE Transactions on Transportation Electrification.* (SCI)
22. Cheng, Y., Zhu, H., Wu, J., Or, S.W., Shao, X., and Chen, Z. (2019), "Online remaining useful life prognosis based on ensemble long short-term memory neural network",

submitted to *IEEE/ASME Transactions on Mechatronics.* (SCI)

23. Shi, X., and Zhu S. (2019), "A comparative study of vibration isolation performance using negative stiffness and inerter dampers", *Journal of the Franklin Institute*, Vol. 356, Paper No.7922-7946. (SCI)

International Conference Papers

1. Chen, R., and Ni, Y.Q. (2019), "SHM-based bridge reliability assessment with inherent modelling uncertainties: A nonparametric Bayesian approach", *Proceedings of the 17th International Probabilistic Workshop*, 11-13 September 2019, Edinburgh, UK;
2. Wei, Y.H., and Ni, Y.Q. (2019), "Variational autoencoder-based approach for rail defect identification", *Proceedings of the 12th International Workshop on Structural Health Monitoring*, 10-12 September 2019, Stanford, California, USA.
3. Liao, C.L., Wang, S., and Ni, Y.Q. (2019), "Application of driving recorder to evaluate rail irregularity and vehicle swing", *Proceedings of the 12th International Workshop on Structural Health Monitoring*, 10-12 September 2019, Stanford, California, USA.
4. Zhang, Q.H., Ni, Y.Q., and Zhou, L. (2019), "A Bayesian probabilistic approach for damage detection of a population of nominally identical structures: Application to railway wheel condition assessment", *Proceedings of the 12th International Workshop on Structural Health Monitoring*, 10-12 September 2019, Stanford, California, USA.
5. Zhou, L., Chen, S.X., Choy, A., and Ni, Y.Q. (2019), "Monitoring of rail bolted joint looseness with PZT network-based EMI technique under a deep learning framework", *Proceedings of the 12th International Workshop on Structural Health Monitoring*, 10-12 September 2019, Stanford, California, USA.
6. Chen, S.X., Ni, Y.Q., Liu, J.C., and Yao, N. (2019), "Deep learning-based data anomaly detection in rail track inspection", *Proceedings of the 12th International Workshop on Structural Health Monitoring*, 10-12 September 2019, Stanford, California, USA.
7. Cheng, C.C., Ni, Y.Q., Hsu, K.T., and Wai, T.T. (2019), "Preliminary study of assessing delaminated cracks in cement asphalt mortar layer of high-speed rail track", *Proceedings of the 12th International Workshop on Structural Health Monitoring*, 10-12 September 2019, Stanford, California, USA.
8. Wang, S., Duan, Y., Yau, J., and Ni, Y.Q. (2019), "Monitoring-assisted derailment prediction of a high-speed train running on a long-span cable-stayed bridge", *Proceedings of the 12th International Workshop on Structural Health Monitoring*, 10-12 September 2019, Stanford, California, USA.

9. Zhang, B.Y., and Ni, Y.Q. (2019), "An inversed greedy method for information-based optimal sensor placement on bridges", *Proceedings of the 12th International Workshop on Structural Health Monitoring*, 10-12 September 2019, Stanford, California, USA.
10. Zhu, Y., Laory, I., and Ni, Y.Q. (2019), "A temperature-driven one-class support vector machine method for anomaly detection", *Proceedings of the 12th International Workshop on Structural Health Monitoring*, 10-12 September 2019, Stanford, California, USA.
11. Wang, Q.A., Ni, Y.Q., and Zhang, C. (2019), "A heteroscedastic Gaussian process approach for SHM-based modelling and forecasting of high-speed rail track slab deformation", *Proceedings of the 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure*, 4-7 August 2019, St. Louis, USA.
12. Wei, Y.H., Ni, Y.Q., and Wang, Q.A. (2019), "A Bayesian probabilistic approach for structural damage detection", *Proceedings of the 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure*, 4-7 August 2019, St. Louis, USA.
13. Ni, Y.Q., Gong, Y., and Wei, Y.H. (2019), "Structural health monitoring using a generative model", *Proceedings of the 14th International Workshop on Advanced Smart Materials and Smart Structures Technology*, 18-21 July 2019, Rome, Italy.
14. Chim, Y.Y., Leung, M.H.F., Ni, Y.Q., and Tsang, E.C.L. (2019), "RFID based battery-free sensor node for smart railway application using 3D-printing technology", *Proceedings of the 1st IEEE International Conference on Flexible and Printable Sensors and Systems*, 7-10 July 2019, Glasgow, UK.
15. Liu, X.Z., and Ni, Y.Q. (2019), "Online high-order wheel polygonal wear detection for high-speed trains", *Proceedings of the 15th International Conference on Railway Engineering*, 3-4 July 2019, Edinburgh, UK.
16. Kanoje, N.K, and Ni, Y.Q. (2019), "Feature identification using guided waves on welded tracks utilizing wavelet signal decomposition", *Proceedings of the 1st International Conference on Advanced Technologies in Intelligent Control, Environment, Computing & Communication Engineering*, 19-20 March 2019, Bangalore, India.
17. Chi, H.L., Thedja, J. and Kim, M.K. (2019), "A Vision-based formwork quality inspection enhancement by using laser scanning and augmented reality,", *Proceedings of the 8th International Conference on Construction Engineering and Project Management (ICCEPM 2019)*, 8-9 December, Hong Kong SAR.
18. Wen, F., Shan, S., and Cheng, L. (2019), "Third harmonic shear horizontal waves for material microstructural degradation monitoring", *Proceedings of the 12th International Workshop on Structural Health Monitoring (IWSHM 2019)*, 11-13

September, Stanford, USA.

Invited Talks and Keynote Speeches

1. Invited speech “Online monitoring and health assessment of rail transit” at the 3rd China Forum on Heath Management Technology for High-Speed Railway, Beijing, China, 21 November 2019.
2. Keynote speech “Rail transit empowered by sensing and artificial intelligence technologies” at the 4th International Conference on Electrical and Information Technologies for Rail Transportation (EITRT2019), Qingdao, China, 25-27 October 2019;
3. Invited speech “Integration of sensing technology and artificial intelligence for smart railways” at the 2019 China International Rail Transit and Equipment Manufacturing Industry Exposition, Changsha and Zhuzhou, China, 17-20 October 2019;
4. Invited speech “Smart railway enabled by innovative sensors and artificial intelligence” at the 2019 Conference on Urban Transportation in the Guangdong-Hong Kong-Macao Greater Bay Area, Shenzhen, China, 26-27 September 2019;
5. Keynote speech “Intelligentizing rail transit by sensing and machine learning” at the 5th International Federation of Automatic Control (IFAC) Symposium on Telematics Applications (TA 2019), Chengdu, China, 25-27 September 2019;
6. Invited speech “A perspective of cooperation on rail transit in the Guangdong-Hong Kong-Macao Greater Bay Area” at the 2019 Conference on Guangdong Rail Transit Equipment Industry Development, Jiangmen, China, 29-30 August 2019;
7. Invited public seminar “Structural health monitoring of railway system” at Wuyi University, Jiangmen, China, 29 August 2019;
8. Invited public seminar “Intelligent rail transit infrastructure” at Missouri University of Science and Technology, Rolla, USA, 8 August 2019 (Coordinator: Prof. G.D. Chen);
9. Keynote speech “Bayesian machine learning for structural health monitoring of rail transit system” at the 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure, St. Louis, USA, 4-7 August 2019;
10. Invited speech “Monitoring driven by big data and machine learning” at the Asian-Pacific-Euro Summer School on Smart Structures Technology, Rome, Italy, 15 July - 3 August 2019;

11. Invited speech “Smart materials and sensors: Application to civil structures and high-speed rail” at the 1st International Conference on Smart Materials and Structures, Jingzhou, China, 18-19 May 2019;
12. Invited speech “Innovative sensors and machine learning algorithms for monitoring-based health management of high-speed railways” at the FCE Translational Research Forum on Sustainable Urban Development in the Greater Bay Area, Hong Kong, 26-27 April 2019;
13. Invited public seminar “Structural health monitoring of railway system” at the HKIE Engineer Day, The Hong Kong Institution of Engineers (HKIE), Hong Kong, 13 April 2019;
14. Keynote speech “Bayesian framework for structural health monitoring of civil infrastructure” at the International Conference on Civil, Architecture and Marine Engineering, Osaka, Japan, 22-23 April 2019;
15. Keynote speech “Structural health monitoring of railway systems using innovative sensing and big data technologies” at the 2nd International Workshop on Structural Health Monitoring and Repair Technology for Railway System in Guangdong-Hong Kong-Macao Greater Bay Area, Dongguan, China, 5 January 2019;
16. Invited speech “Optical fibre sensing networks for condition-based and predictive maintenance of railway systems,” at 2019 IEEE British-Irish Conference on Optics & Photonics, IEEE BICOP 2019, London, United Kingdom, 10-13 December 2019. (Hwa-Yaw Tam)
17. Invited speech “An accidental discovery to enable ai-based large-scale photonic sensor networks” at 14th Asia-Pacific Physic Conference, Kuching, Malaysia, 18-22 November 2019. (Hwa-Yaw Tam)
18. Keynote speech “Novel electromagnetism-based structural vibration control devices and strategies” at the 8th National Conference on Structural Control and Health Monitoring (SVCHM8), Hefei, China, 22-24 November 2019. (Songye Zhu)

■ Awards and Patents

1. Recipient of the Dean’s Award for Outstanding Achievement in Research Funding (Principal Investigator), Faculty of Construction and Environment, The Hong Kong Polytechnic University, 2019;
2. Recipient of the Commendation Merit Award of Structural Excellent Award 2019 (R&D Award), The Hong Kong Institution of Engineers (HKIE), 2019 (Su, J.Z., Xia, Y., Zhu, L.D., Zhu, H.P., and Ni, Y.Q. (2017), “Typhoon- and temperature-induced quasi-static responses of a supertall structure”);

3. Recipient of the Finalist Award of Structural Excellent Award 2019 (R&D Award), The Hong Kong Institution of Engineers (HKIE), 2019 (H.P. Wan, and Y.Q. Ni, "Condition-based maintenance of high-speed railway vehicle wheels through trackside monitoring");
4. Wang B and Zhu S "Hybrid self-Centreing and viscous dampers". China Invention Patent (pending), Filing Date: 26 June 2019. Filing No: CN201920979128.5.

■ Professional Activities

1. Vice President (Finance) of International Society for Structural Health Monitoring of Intelligent Infrastructure (ISHMII) (since 2019);
2. Executive Member of International Society for Structural Health Monitoring of Intelligent Infrastructure (ISHMII) (since 2019);
3. Chair of Organizing Committee of the 3rd China Forum on Heath Management Technology for High-Speed Railway, 21 November 2019, Beijing, China.
4. Member of International Organization Committee of the 12th International Workshop on Structural Health Monitoring, 10-12 September 2019, Stanford, California, USA;
5. Member of International Advisory Board of the 7th International Conference on Structural Engineering, Mechanics and Computation, 2-4 September 2019, Cape Town, South Africa;
6. Member of Advisory Committee of the 10th Cross-Strait Workshop on Structural Monitoring and Vibration Control in Civil Engineering, 23-26 August 2019, Wuhan, China;
7. Member of International Scientific Committee of the 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure, 4-7 August 2019, St. Louis, USA;
8. Member of Scientific Committee of the 14th International Workshop on Advanced Smart Materials and Smart Structures Technology, 18-21 July 2019, Rome, Italy;
9. Member of International Scientific Committee of the 15th International Conference on Railway Engineering, 3-4 July 2019, Edinburgh, UK;
10. Member of Scientific Committee of the 1st National Conference on Computation and Simulation Technology in Civil Engineering, 24-26 May 2019, Wuhan, China;
11. Member of Academic Committee of the 1st International Conference on Smart Materials and Structures, 18-19 May 2019, Jingzhou, China;

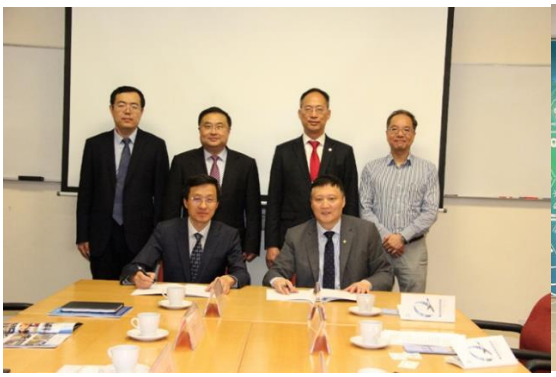
12. Chair of Organizing Committee of the Workshop on Structural Health Monitoring System for Smart Infrastructure and Buildings, 27 April 2019, Hong Kong;
13. Member of Scientific Committee of the International Conference on Civil, Architecture and Marine Engineering, 22-23 April 2019, Osaka, Japan;
14. Chair of Organizing Committee of the 1st Workshop on Guangdong-Hong Kong-Macao Greater Bay Area Maglev and Advanced Rail Transit Development, 21 March 2019, Hong Kong;
15. Member of Program Committee of the 2019 SPIE Smart Structures/NDE Conference on Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems, 3-7 March 2019, Denver, Colorado, USA;
16. Session Chair of the 12th International Workshop on Structural Health Monitoring, 10-12 September 2019, Stanford, California, USA;
17. Session Chair of the 10th Cross-Strait Workshop on Structural Monitoring and Vibration Control in Civil Engineering, 23-26 August 2019, Wuhan, China;
18. Session Chair of the 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure, 4-7 August 2019, St. Louis, USA;
19. Session Chair of the 14th International Workshop on Advanced Smart Materials and Smart Structures Technology, 18-21 July 2019, Rome, Italy;
20. Session Chair of the 1st International Conference on Smart Materials and Structures, 18-19 May 2019, Jingzhou, China;
21. Guest editor for a special issue on “A Special Issue Dedicated to Professor Jan Ming Ko” in the international journal *Advances in Structural Engineering*, Vol. 22, N0. 16, 2019.

Collaborations & Communications

Signed Collaboration Agreements

Collaboration with the Qingdao West Coast New Area Government

On 12 April, 2019, Mr. Ying Lu, Head of the Organization Department of the Qingdao Coastal New Area Working Committee, led a team to visit the Hong Kong Polytechnic University. During the visit, a memorandum of cooperation was signed by Prof. Yi-Qing Ni, Director of CNERC-Rail, and Mr. Hai-Jie Xue, Deputy Director of the Management Committee of Qingdao Sino-German Eco Park. Prof. Alexander Wai, Vice President (Research Development) of the Hong Kong Polytechnic University, Dr. Xuan Luo, Director of Chinese Mainland Affairs Office of the Hong Kong Polytechnic University, Mr. Jian-Hui Feng, Director of the Recruitment Centre of Qingdao West Coast New Area, Dr. Terence L.T. Lau, Director of Innovation and Technology Development of the Hong Kong Polytechnic University and Dr. Songye Zhu, Dr. Siu-Kai Lai, Dr. You Dong, members of the CNERC-Rail, also attended the signing ceremony. After the signing ceremony, the delegation of Qingdao West Coast New Area Government visited Smart Railway Research Laboratory, Aviation Engineering Laboratory, and 3D Printing Laboratory in the Hong Kong Polytechnic University.



Collaboration with National Maglev Transportation Technology Research Centre of Tongji University

On 3 January, 2019, Prof. Yi-Qing Ni, Director of CNERC-Rail, and his team conducted in-depth discussions with the members of the National Maglev Transportation Technology

Research Centre of the Tongji University on the development and application of maglev technology. Agreements on the development of maglev transportation systems on technology and application were also signed including: carrying out experimental research on maglev train track-control coupling model; developing the maglev train monitoring and detection technology in the research field of the National Maglev Transportation Research Centre associated with the CNERC-Rail's FBG sensing technology; establishing the maglev train noise model; optimization techniques for maglev train's control systems; and establishing the academic exchanges mechanism. Dr. Songye Zhu, Dr. Su-Mei Wang, Dr. Shun-Yee Liu and Mr. Tai-Tung Wai in the CNERC-Rail also attended the visit.

Collaboration with China University of Petroleum (East China) and Dresden University of Technology

On 25 September, 2019, CNERC-Rail, China University of Petroleum (East China) and the Technical University of Dresden jointly signed a tripartite cooperation agreement. CNERC-Rail and the two universities are committed to jointly promote cooperation in the development of research and education, including but not limited to: exchange of research and expertise, exchange of academic staff and students in specific research projects, joint guidance of graduate programs, joint appointment of renowned professors, joint promotion the research outputs, and joint participation in and application for the international funded-projects. The three parties agreed to further explore cooperation in the topics which include the intelligent monitoring technology for rail transit, intelligent structure monitoring technology for large-scale civil infrastructure, and intelligent monitoring technology for oil and energy industry facilities.

Collaboration with Guangzhou Metro Group Co., Ltd.

In 2019, Prof. Yi-Qing Ni of CNERC-Rail led a team to visit the Guangzhou Metro Group

Co., Ltd. Ms. Hong-Yan Liao, Director of National Engineering Laboratory for System Safety and Operation Assurance of Urban Rial Transit, welcomed the delegation of CNERC-Rail, including Dr. Xiao-Zhou Liu, Dr. Xiang-Yun Deng, Mr. Tai-Tung Wai, and Mr. Wing-Hong Kwan. The two parties signed a cooperation agreement on " Applications of noise reduction and vibration control techniques on urban rail transit systems ". The collaborations include: on-site testing of vibration and noise of the track structure in the viaduct and tunnel structure; in-vehicle noise modelling, analysis of train vibration and noise sources; development and application of new rail dampers for noise reduction of different areas for the rail wave suppression; analysis on wheel detect and the relationship between wheel roughness, track structure vibration and wheel-rail noise level; the rail abrasion test and its contribution to track structure vibration level and wheel-rail noise level.

Establishment of the Guangdong-Hong Kong-Macau Greater Bay Area Rail Transit Joint Innovation Union

The Hong Kong Polytechnic University and Shenzhen University jointly spearhead the establishment of the Guangdong-Hong Kong-Macau Greater Bay Area Rail Transit Joint Innovation Union (the Union), upon signing a memorandum of understanding on 12 October 2018 with 10 other universities and enterprises. The Union aims to advance research around rail engineering, thus contributing to the development of the rail transit system within Guangdong-Hong Kong-Macau Greater Bay Area.

On January 11, 2019, the 1st council and technical committee meeting of the Union was held in Shenzhen University. This is the first general meeting of all members since the establishment of the Union. Prof. Alexander Wai, Vice President (Research Development) of the Hong Kong Polytechnic University and Prof. Yi-Qing Ni, Director of CNERC-Rail,

attended the conference. Academicians of the Chinese Academy of Engineering Prof. Yan-Liang Du, Prof. Chun-Fang Lu, Prof. Fu-Lin Zhou, Prof. Jin-Ping Ou, Prof. Fu-Ming Wang, and Prof. Xiang-Sheng Chen, Fellow of Australian Academy of Technological Science and Engineering Prof. Hong Hao, and Academician of the Engineering Academy of Japan Prof. Zhi-Shen Wu, attended the conference.

On 15 November, 2019, the annual meeting of the Union was held at Shenzhen Urban Transport Planning Centre. Mr. Song-Ming Xu, Deputy Secretary of Shenzhen Municipal Government, Mr. Qing Yang, Deputy Director of Shenzhen Urban Railway Transit Association, and Prof. Yan-Liang Du, Director of the Union, attended the meeting and delivered speeches. Prof. Chun-Fang Lu, Prof. Fu-Ming Wang, Prof. Hua-Ming Wang, Prof. Xiang-Sheng Chen, Prof. He-Ping Xie, Academicians of the Chinese Academy of Engineering and Prof. Xia-Ting Feng, Vice President of Northeastern University conducted in-depth academic discussions and exchanges on the cutting-edge technologies and development trends in rail transit. Prof. Yi-Qing Ni, Director of CNERC-Rail, reported on the annual research progress of "Research Direction 3: Network Sensing" led by CNERC-Rail.

On 13 December, 2019, a meeting between technical leaders of the Union was held at the Shenzhen Urban Transport Planning Centre. Prof. Yan-Liang Du, member of the Chinese Academy of Engineering and Director of the Union, chaired the meeting. Participants from the China Academy of Railway Sciences, the China Railway Eryuan Engineering Group Co, Ltd., Railway Engineering Consulting Group Co, Ltd, Sun Yat-sen University, National Maglev Transportation Technology Research Centre of the Tongji University, Shenzhen University, Hong Kong Polytechnic University, Beijing Jiaotong University and other units had a detailed discussed on the rail technology output accumulation, research plans, and collaboration respectively. Prof. Yi-Qing Ni, Director of CNERC-Rail, represented the Hong Kong Polytechnic University during the meeting.

Organized Conferences

The First Workshop on Guangdong-Hong Kong-Macao Greater Bay Area Maglev and Advanced Rail Transport Development

On 21 March, 2019, the Hong Kong Polytechnic University, Southwest Jiaotong University, Dashun Foundation, and the Guangdong-Hong Kong-Macau Greater Bay Area Rail Transit Joint Innovation Union (the Union) hosted “The First Workshop on Guangdong-Hong Kong-Macao Greater Bay Area Maglev and Advanced Rail Transport Development”. The symposium was hosted by CNERC-Rail and attracted nearly hundreds of experts and scholars from the Mainland and Hong Kong to attend. The parties conducted wide and in-depth discussions and exchanges on the development of the maglev transportation for urban rail transit.

Academician Tie-Niu Tan, Deputy Director of the Liaison Office of the Central People's Government in the Hong Kong SAR, Dr. Chung-Tai Ho, Chairman of the Dashun Foundation, Mr. Wing-Hang Sit, Director of Electrical and Mechanical Services of the Hong Kong SAR Government, and Prof. Alexander Wai, Vice President (Research Development) of the Hong Kong Polytechnic University were invited as the guest in this workshop.

During the workshop, Prof. Qing-Quan Qian and Prof. Yan-Liang Du, academicians of the Chinese Academy of Engineering presented keynote speeches entitled “Development and Prospects of Rail Transit” and “Strategies for Integrated Development of Modern Rail Transit in the Greater Bay Area”. The keynote report was chaired by Prof. Xiang-Sheng Chen from Shenzhen University.

The invited talks of this workshop were chaired by Prof. Shi-Bin Gao, Director of. Prof Xiao-Hong Chen, Director of the National Maglev Transportation Engineering Technology Research Centre of Tongji University, Mr. Ying Yang, Deputy Chief Engineer of CRRC Zhuzhou Locomotive Co., Ltd., Mr. Xiao-Chun Zhang Director of Shenzhen Urban Transportation Planning Centre, Mr. Hai-Lin Xie, General Manager of China Railway Maglev Transportation Investment Construction Co., Ltd. and Dr. Hong-Liang Pan, Senior Engineer of the National Maglev Transportation Engineering Technology Research Centre of Tongji University were invited to present reports. The session was chaired by Prof. Shi-Bin Gao, Director of the National Rail Transit Electrification and Automation Engineering Technology Research Centre of Southwest Jiaotong University.

Workshop on Structural Health Monitoring System for SMART Infrastructure and Buildings

On 27 April, 2019, “Workshop on Structural Health Monitoring System for SMART Infrastructure and Buildings” was successfully held at the Hong Kong Polytechnic

University. This seminar was jointly hosted by the CNERC-Rail, CCCC Third Harbor Macau Co., Ltd., and Dashun Foundation, and was co-sponsored by Pypun Engineering Consultants Ltd., Alben Investment, Belt and Road Global Forum and Society of Operations Engineers. This seminar aims to provide opportunity for professionals from different regions and institutions to discuss advanced technologies and their successful cases of structural health monitoring, further encourage exchanges and collaborations between universities and companies, and promote the intelligent development of infrastructure and building structure.

Dr. Chung-Tai Ho, Chairman of the Dashun Foundation, Belt and Road Global Forum, and Society of Operations Engineers, was specially invited to give an opening speech. Mr. Wai-Yi Chan, Chief Engineer of Highways Department of the Hong Kong Government, Dr. Peng-Kong Ao of the Civil Engineering Laboratory of Macau, Prof. Jan-Ming Ko, Emeritus Professor of the Hong Kong Polytechnic University, and Dr. Ze-Kun Cheng of CCCC Third Harbor Macau Co., Ltd. were also invited to give a talk.

Prof. Yi-Qing Ni, Director of CNERC-Rail, was the chairman of the organizing committee and chaired the forum. Dr. Song-Ye Zhu, Dr. Jin Guo and Dr. Yan-Jie Zhu of CNERC-Rail also delivered speeches.

The 3rd China High-Speed Railway Health Management Technologies

On 21 November, 2019, the 2nd day of the Modern Railways 2019, “The 3rd China High-Speed Railway Health Management Technologies", organized by the CNERC-Rail and co-organized by Southwest Jiaotong University Railway Development Co., Ltd., was successfully held in Beijing National Convention Centre.

The theme of this forum is "High-speed Railway Infrastructure Health Management Theory and Technology", aiming at the frontiers and hot problems in the new stage of China's high-speed railway. This forum invited many academicians, experts and scholars in the field of rail transportation all over the world and focused on the latest developments and technologies of rail transit, in order to better promote China's high-speed railway health management and technology. More than 350 guests attended to the forum.

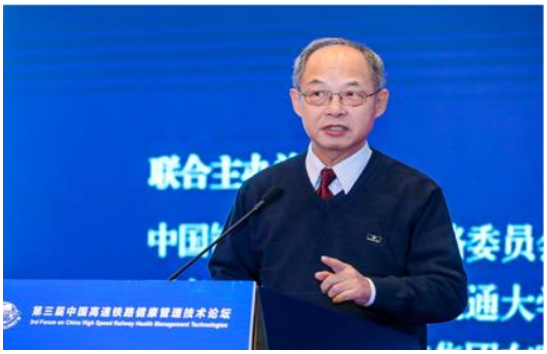
Mr. Jian-Dong Chen, Deputy Director of the High-speed Railway Committee of China Railway Society, chaired the opening ceremony. Prof. Chun-Fang Lu, Chairman of the China Railway Society, member of the Chinese Academy of Engineering, Director of the Science and Technology Department of China National Railway Group Co., Ltd., Prof. Guo-Tang Zhao, Vice Chairman of the China Railway Society, Prof. Otto Chui-Chau Lin, Senior Consultant to President of the Hong Kong Polytechnic University and Foreign Academician of the Royal Swedish Academy of Engineering Sciences, delivered speeches.

Prof. Yan-Liang Du chaired the forum. Other members of the Chinese Academy of Engineering, including Prof. Jin-Ping Ou, Prof. Yong-Bin Yang, Prof. Zheng-Qing Chen, Prof. Fu-Ming Wang, and Prof. Xiang-Sheng Chen, are invited to give keynote speeches, respectively.

Prof. Yi-Qing Ni, Director of CNERC-Rail and Chair Professor of the Hong Kong Polytechnic University also delivered a keynote speech entitled “Online Monitoring and Health Assessment of Rail Transit”.


联合主办单位:


承办单位
香港理工



Attended Conferences

Asia Pacific Rail 2019 (Hong Kong, China)

Asia Pacific Rail 2019 was held at the Hong Kong Convention and Exhibition Centre on 19-20 March, 2019. As the top event in the railway industry in Asia-Pacific, this conference has successfully attracted more than 2000 participants from 42 countries and become the largest event since last 21 years. At the conference, the largest and most influential railway operators, associations, service solution providers, consultants and government delegations in Asia-Pacific gathered to discuss the issues related to railway construction.

CNERC-Rail attended the conference as an exhibitor. Prof. Yi-Qing Ni, Director of CNERC-Rail, chaired the Putonghua session of the new Greater China seminar, which invited more than 10 experts and scholars in the railway field to deliver presentations. Centre members Dr. Lu Zhou, Dr. Xiao-Zhou Liu, Dr. Su-Mei Wang, and Dr. Yan-Jie Zhu also delivered speeches at different sessions, respectively.

Rail Solutions Asia 2019 (Kuala Lumpur, Malaysia)

During 10-12 April, 2019, Research Assistant Professor Lu Zhou, member of CNERC-

Rail, participated in the Rail Solutions Asia 2019 held in Malaysia. This event was organized by Malaysia and Southeast Asia to vigorously promote railway equipment, systems, and inspection and maintenance technologies. Dr. Lu Zhou was invited to deliver a presentation entitled “Advances in Structural Control and Health Monitoring Applications on Modern Rail Transit”. Centre members, Prof. Hwa-Yaw Tam and Dr. Shun-Yee Liu participated in the exhibition on behalf of the Hong Kong Polytechnic University.

Translational Research Forum on Sustainable Urban Development in the Greater Bay Area (Hong Kong, China)

On 26 April, 2019, the Faculty of Construction and Environment of PolyU held the Translational Research Forum on Sustainable Urban Development in the Greater Bay Area. Prof. Yi-Qing Ni, Director of CNERC-Rail, gave a presentation entitled “Innovative sensors and machine learning algorithms for monitoring-based health management of high-speed railways” in this forum.

This forum aims to provide a platform for researchers, business leaders, industry partners and government personnel in the Guangdong-Hong Kong-Macao Greater Bay Area to discuss challenging issues in the Greater Bay Area and jointly promote the development in the Bay Area. It also showcased the latest research results of sustainable urban planning, especially on topics such as architecture, energy, environment, and urban informatization. The approaches to creating win-win cooperation opportunities for different stakeholders in the Greater Bay Area were also discussed.

The 1st International Conference on Smart Materials and Structures (Jingzhou, China)

On 17-19 May, 2019, the 1st International Conference on Smart Materials and Structures was held in Jingzhou, Hubei Province, China. The purpose of this academic conference is to explore new sensors, new monitoring methods and new calculation theory in structural health monitoring, and actively seek the sustainable development and application of future intelligent buildings and structures. More than 300 experts and scholars at home and abroad attended the conference, including Xin-Qiang Niu, Honorary Chairman of the Conference, President of Hubei Civil Engineering and Architecture Society, Academician of the Chinese Academy of Engineering, Jin-Ping Ou, Academician of the Chinese Academy of Engineering, Jin-Guang Teng, Academician of the Chinese Academy of Sciences, President of the Hong Kong Polytechnic University, Yu-Qiu Sun, Vice Mayor of Jingzhou, Ye-Hong Zhu, Secretary of the Party Committee of Yangtze University, Zheng Feng, President of Yangtze University, Zhi-Shen Wu, Academician of the Japanese Academy of Engineering, Hao Hong, Academician of the Australian Academy of Engineering, and Farhad Ansari, a professor at the University of Illinois at Chicago. Director of CNERC-Rail, Prof. Yi-Qing Ni, was invited to present a keynote speech "Smart materials and sensors: Application to civil structures and high-speed rail" at the conference.

The 14th International Workshop on Advanced Smart Materials and Smart Structures Technology (Rome, Italy)

On 18-22 July, 2019, the 14th International Workshop on Advanced Smart Materials and Smart Structures Technology was held in Rome. The workshop aimed to evaluate current smart materials and structural technologies and help researchers in different fields from different countries to conduct comprehensive research on smart materials and structural technologies. Prof. Yi-Qing Ni, Director of CNERC-Rail, attended the workshop. On 22 July, he was invited to give a speech entitled “Monitoring driven by big data and machine learning” at the Asian-Pacific-Euro Summer School on Smart Structures Technology, which was chaired by Prof. Vincenzo Gattulli.

The 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure (St. Louis, USA)

On 4-7 August, 2019, the 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure was held in St. Louis, USA. Prof. Yi-Qing Ni, Director of the CNERC-Rail and Centre member Mr. Yuan-Hao Wei, attended the conference. Prof. Ni was invited to give a keynote speech entitled “Bayesian machine learning for structural health monitoring of rail transit system”. He also gave a presentation entitled “A heteroscedastic Gaussian process approach for SHM-based modelling and forecasting of high-speed rail track slab deformation” in the Session “SHM towards Smart, Resilient and Sustainable Civil Infrastructures”. In the Session “Data Fusion and Analytics- 2”, Mr. Yuan-Hao Wei presented “A Bayesian Probabilistic Approach for Structural Damage Detection”.

The 10th (2019) Conference on Monitoring and Controlling of Civil Engineering (MCCE) (Wuhan, China)

On 23-26 August, 2019, the 10th The 10th (2019) Conference on Monitoring and Controlling of Civil Engineering (MCCE) was held in Wuhan, China. This event was organized by Zhejiang University, Tongji University, PolyU, Taiwan University, Central University, National Centre for Research on Earthquake Engineering, and University of Macau. It aimed to promote the training, academic development and technological progress of civil engineering monitoring and control in Mainland, Hong Kong, Macao and Taiwan. Prof. Yi-Qing Ni, Director of CNERC-Rail, attended this event as a member of the Steering Expert Committee, a member of the Academic Committee and a member of the Seminar Organization Committee. At the closing ceremony, he delivered a speech as the representative of the next organizer of this event and welcomed participants to attend this event in PolyU in 2020.

Guangdong Rail Transit Equipment Industry Development Conference (Jiangmen, China)

On 30 August, 2019, the Guangdong Rail Transit Equipment Industry Development Conference, was held in Jiangmen, Guangdong, China. The conference was jointly hosted by Jiangmen Government, CRRC Qingdao Sifang Locomotive and Rolling Stock Co., Ltd., CRRC Nanjing Puzhen Vehicle Co., Ltd., Guangdong Railway Construction Investment Group Co., Ltd., Jiangmen Xinhui District People's Government and CRRC Guangdong Rail Transit Vehicles Co. Ltd. It aimed to implement "The development plan for Guangdong-Hong Kong-Macao Greater Bay Area" and "Thirteenth Five-Year Plan", to showcase the development results of Guangdong (Jiangmen) Rail Transit Industrial Park, and to accelerate the establishment of world-class rail transit industry base in Jiangmen.

At this conference, Prof. Yi-Qing Ni, Director of CNERC-Rail, was invited to introduce the recent works of the CNERC-Rail. He also disclosed the plan to apply for an International Intelligent Rail Transit Joint Research Centre to promote the internationalization of the research and application of rail transit technology in the Greater Bay Area.

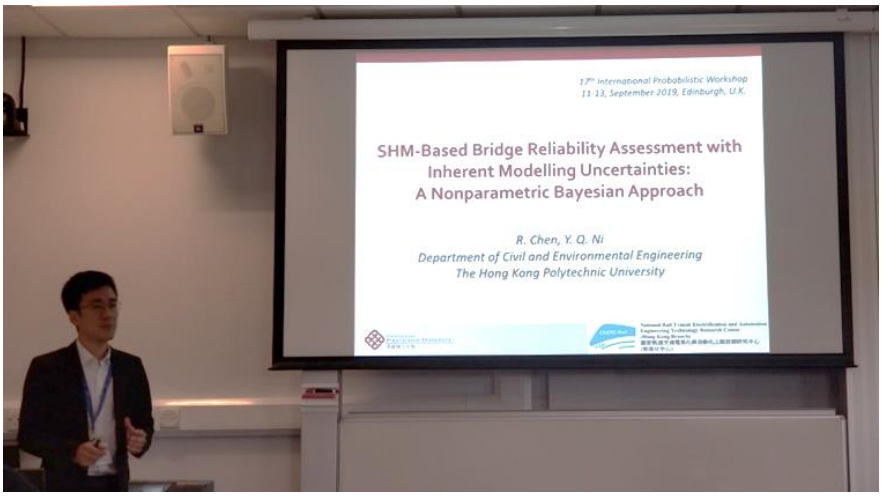
The 12th International Workshop on Structural Health Monitoring (San Francisco, USA)

On 9-12 September, 2019, Prof. Ni, Director of CNERC-Rail and Centre member Dr Su-Mei Wang, along with PhD students Qiu-Hu Zhang, Si-Xin Chen, Bei-Yang Zhang, and Yuan-Hao Wei, attended the 12th International Workshop on Structural Health Monitoring. This biennial workshop was held at Stanford University in the USA to evaluate the most advanced technologies in the field of structural health monitoring and to discuss and identify critical breakthroughs and challenges. Prof. Yi-Qing chaired three special sessions “Structural Health Monitoring and Condition-based Maintenance of High-speed and Intercity Railways”. Dr Su-Mei Wang made two presentations entitled “Monitoring-Assisted Derailment Prediction of a High-Speed Train Running on a Long-Span Cable-Stayed Bridge” and “Application of Driving Recorder to Evaluate Rail Irregularity and Vehicle Swing”. Mr. Qiu-Hu Zhang gave a presentation entitled “A Bayesian Probabilistic Approach for Damage Detection of a Population of Nominally Identical Structures: Application to Railway Wheel Condition Assessment”. Mr. Si-Xin Chen made a presentation entitled “Monitoring of Rail Bolted Joint Looseness with PZT Network-Based EMI Technique under a Deep Learning Framework” and presented a poster entitled “Deep Learning-Based Data Anomaly

Detection in Rail Track Inspection". Mr. Bei-Yang Zhang delivered a presentation on "An Inversed Greedy Method for Information-Based Optimal Sensor Placement on Bridges". Mr. Yuan-Hao Wei presented "Variational Autoencoder-Based Approach for Rail Defect Identification".

The 17th International Probabilistic Workshop (Edinburgh, UK)

On 11-13 September, Ran Chen, PhD student from CNERC-Rail, participated in the 17th International Probabilistic Workshop held at Heriot-Watt University in Edinburgh, UK. He delivered a presentation entitled "SHM-Based Reliability Assessment with Inherent Modelling Uncertainties: A Nonparametric Bayesian Approach".



Planning & Design and Cooperative Development of Modern Rail Transit Summit under the background of Guangdong-Hong Kong-Macao Greater Bay Area Policy (Shenzhen, China)

On 26 September, 2019, Planning & Design and Cooperative Development of Modern Rail Transit Summit under the background of Guangdong-Hong Kong-Macao Greater Bay Area Policy was held in Shenzhen, China. This forum was co-organized by Guangdong-Hong Kong-Macau Greater Bay Area Rail Transit Joint Innovation Union and Shenzhen Urban Transport Planning Centre. The purpose was to discuss and blueprint the future development of rail transit in the Greater Bay Area. Prof. Yi-Qing Ni, Director of CNERC-Rail, delivered a keynote speech on “Smart railway enabled by innovative sensors and artificial intelligence”. Centre members Dr. Su-Mei Wang, Dr. You-Wu Wang, Dr. Xiang-Yang Xu and Dr. Xiang-Yun Deng attended this forum.

2019 China International Rail Transit and Equipment Manufacturing Industry Expo & Zhuzhou Forum (Zhuzhou, China)

On October 18, 2019, Prof. Ni Yiqing of Hong Kong Polytechnic University and Director of National Rail Transit Electrification and Automation Engineering Technology Research Center (Hong Kong branch), was invited to China International Rail Transit and Equipment Manufacturing Industry Expo & Zhuzhou Forum and present a keynote speech “Smart Railway: The Fusion of Sensor Technology and Artificial Intelligence ". Prof. Ni introduced his team's artificial intelligence-based intelligent monitoring cloud platform, and said that electrified high-speed maglev trains will be the focus of the country's future rail transit development, and collecting maglev-related data will be particularly important, which can

help maglev trains with a safe, comfortable and reliable operation. Prof. Ni Yiqing also pointed out that the intelligent monitoring cloud platform has been implemented on Singapore Metro, MTR and Chinese high-speed railways, and responses are good.

The 4th International Conference on Electricity and Information Technology of Rail Transit and Forum on Technology Development of Intelligent Rail Transit System (Qingdao, China)

From October 25th to 27th, the 4th International Conference on Rail Transit Electrical and Information Technology and Intelligent Rail Transit System Technology Development Forum, co-sponsored by the China Electrotechnical Society and the State Key Laboratory of Rail Transit Control and Safety of Beijing Jiaotong University was held in Qingdao. The purpose of this forum is to better promote the development of rail transit system technology, and the collaborative innovation capability of the rail transit industry. A total of more than 350 leaders, experts and authors from dozens of well-known universities, scientific research institutions and enterprises in the field of rail transit attended the conference. Prof. Ni Yiqing was invited to present a speech on "Fusion of sensors for high-speed rail and artificial intelligence technology".

Technical Communications

Visit to Hunan Maglev Transportation Development Co., Ltd.

On 2 January, 2019, Prof. Yi-Qing Ni, Director of CNERC-Rail, led a team to visit Hunan Maglev Transportation Development Co., Ltd. The team also includes Dr. Songye Zhu, Dr. Su-Mei Wang, Dr. Shun-Yee Liu and Mr. Tai-Tung Wai. The two parties conducted in-depth discussions on various studies carried out on the maglev train-track-control system and confirmed that experimental verification studies for the medium and low-speed maglev lines in Changsha would be carried out. After the meeting, Centre members of CNERC-Rail visited the Changsha mid-/low-speed maglev line.

Visit to CRRC Zhuzhou Electric Locomotive Co., Ltd.

On 3 January, 2019, Prof. Yi-Qing Ni, director of CNERC-Rail and other Centre members including Associate Professor Song-Ye Zhu, Dr. Su-Mei Wang, Dr. Shun-Yee Liu and Mr. Tai-Tung Wai, paid a visit to CRRC Zhuzhou Electric Locomotive Co., Ltd. They were welcomed by Ying Yang, Deputy Chief Engineer of this company. The two parties discussed the application of online sensing technology based on optical fiber sensing on maglev trains. After the meeting, members of CNERC-Rail visited the online monitoring and testing

platform and the mid-/low-speed maglev testing line.


Visit to China Academy of Railway Sciences

On 9-18 January, 2019, Dr. Lu Zhou, Dr. Yun-Lai Zhou, Dr. You-Wu Wang, Dr. Xiao-Zhou Liu, Dr. Su-Mei Wang, Dr. Yan-Jie Zhu, and PhD students Qiu-Hu Zhang, Chi Xu and Si-Xin Chen paid a visit to China Academy of Railway Sciences (CARS) During this period, both sides delivered academic presentations to introduce their research works. On this basis, the two sides discussed “How to apply the CNERC-Rail’s research on big data and machine learning to the field monitoring data from CARS”. Finally, the two sides confirmed the cooperation of research on several topics, such as track inspection data cleaning, automatic identification of abnormal data and fault early warning technology, and turnout state analysis based on track inspection data (wheel-rail force, axle box acceleration, geometric data).



Visit to CRRC Qingdao Sifang Locomotive & Rolling Stock Co., Ltd.

On 28 January, 2019, Prof. Yi-Qing Ni, Director of CNERC-Rail, led a team to visit CRRC Qingdao Sifang Locomotive & Rolling Stock Co., Ltd and Sifang Engineering Research Centre. The team also included Dr. Xiao-Zhou Liu, Dr. Shun-Yee Liu and Mr. Chao Zhang. They were received by two Deputy Directors of Sifang Engineering Research Centre, Shao-Qing Liu and Ai-Qin Tian. Both parties confirmed cooperation on experimental research on axle crack monitoring technologies based on ultrasonic guide waves and online condition monitoring of bogies based on fiber grating technology.


Visit to Suzhou Rail Transit Group Co., Ltd.

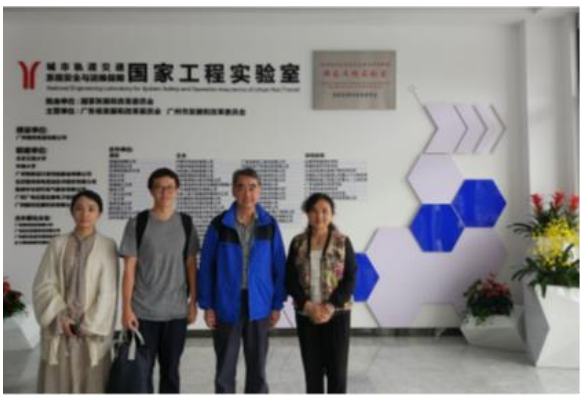
On 21 February, 2019, Dr Xiao-Zhou Liu, a member of CNERC-Rail and members of China SWJTU Railway Development Co., Ltd., paid a visit to Suzhou Rail Transit Group Co., Ltd. and conducted technological exchange. Dr Xiao-Zhou Liu introduced the latest research and development results of the Centre and the railway wheel condition monitoring system to the participating experts and technical leaders. Mr. Jian-Ming Han, General Manager of the operating branch, attended the meeting, and the two sides discussed future cooperation in the monitoring of urban rail transit vehicles and rail infrastructure.

Visit to Shenzhen Metro Group Co., Ltd.

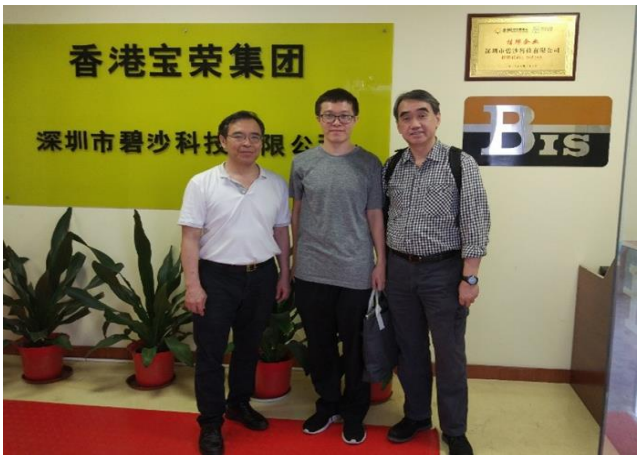
On 13 March, 2019, Dr Xiao-Zhou Liu, a member of CNERC-Rail, Dr Laura Lo, Director of Chinese Mainland Affairs Office, Meggie Chen, Chief Executive Officer of Shenzhen Base & Shenzhen Research Institute and Zhu-An Li, Director of the Education Centre of Shenzhen Research Institute of PolyU, paid a visit to Shenzhen Metro Group Co., Ltd. and met Mr. Jie Xin, Chairman of the board and the senior technical staffs of this company. Jie Xin mentioned the 40th anniversary of reform and opening up, the promulgation of the Guangdong-Hong Kong-Macao Greater Bay Area planning outline and the future development of the Lok Ma Chau Loop Hong Kong-Shenzhen Innovation and Technology Park. He hoped that, Shenzhen Metro can actively cooperate with CNERC-Rail in the short future.

Visit to Guangzhou Metro Group Co., Ltd.

On 16 April, 2019, Dr Xiao-Zhou Liu and Mr. Tai-Tung Wai, members of CNERC-Rail, visited Guangzhou Metro Group Co., Ltd. They were received by Shi-You Zhu and Jiang-Hai He, General Manager and Deputy General Manager of the company. The two parties conducted in-depth discussions on rail corrugation problem and vibration and noise reduction technologies. Guangzhou Metro highly evaluated CNERC-Rail's research on track vibration reduction and noise reduction and assigned engineers to discuss the development of field tests on rail corrugation growth and vibration and noise reduction.



Visit to BISA Technologies Ltd.



On 23 April, 2019, Dr Xiao-Zhou Liu and Mr. Tai-Tung Wai, members of the CNERC Rail, paid a visit to BISA Technologies Ltd. in Shenzhen. They were received by the director of this company. Both parties discussed on the feasibility of combining RFID sensors and wireless data transmission technology with temperature, strain, acceleration, acoustics, displacement sensors, which are commonly used in railway condition monitoring, as well as its multi-channel solution.

Visit to China Academy of Railway Sciences

On 18 October, 2019, Associate Professor Zhen Leng, a member of CNERC-Rail, led a team to visit the Infrastructure Inspection Institute of the China Academy of Railway Sciences (CARS). The team also included Dr. Jin Guo, Dr. Xiang-Yang Xu, Dr. You-Wu Wang and Dr. Xiang-Yun Deng. They were received by Fa-Lin Qi, Xiu-Bo Liu, Jin-Zhao Liu and Fei Yang etc., researchers of the Infrastructure Inspection Institute. The two sides held an academic meeting, where they made academic representations and conducted in-depth discussions on ground-penetrating radar-based railway detection, track damage detection and tunnel visual measurement. The CARS proposed to cooperate with CNERC-Rail on research on ground-penetrating radar-based inspection, rail crack growth and the formation mechanism of corrugation.

Visit to China Academy of Railway Sciences

On 22 November, 2019, Prof. Chui-Chau Lin, Senior Advisor to the President of PolyU, and Prof. Yi-Qing, Ni, Director of CNERC-Rail, led a team to visit the Infrastructure Institute of the China Academy of Railway Sciences. The team also included Dr. Jin Guo, Dr .Xiang-Yang Xu, Dr. Xiao-Zhou Liu and Dr. Xiang-Yun Deng. They were received by Zao-Tian Ke, Director of the Institute, researcher Jin-Zhao Liu, deputy researcher Jian-Jun Qu, and Fei Yang , Director for the Track Management Department. The two sides held an academic meeting, where they delivered presentations about high-speed railway monitoring and data processing and reported on recent cooperation progress. On this basis, the two parties proposed to continue cooperating in the research on railway monitoring and inspection, big data processing and formation mechanism of rail corrugation.

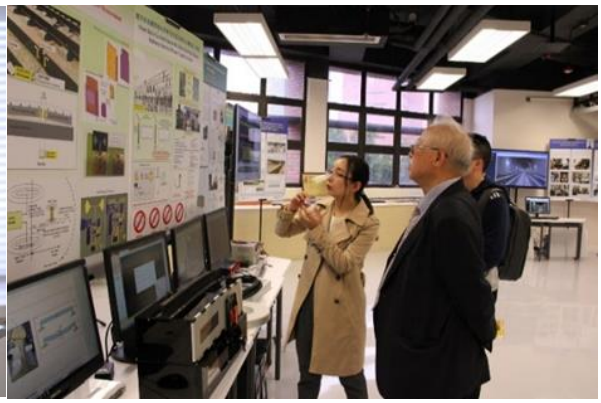
Academic Seminars

Seminar by Prof. Wei-Xin Ren from Hefei University of Technology

On 7 January, 2019, Prof. Wei-Xin Ren, Dean of the Department of Civil and Hydraulic Engineering at the Hefei University of Technology (HFUT), visited the CNERC-Rail and gave a seminar entitled “Uncertainty and Nonlinear Issues on Structural Health Monitoring Data of Bridge.” Then, Prof. Wei-Xin Ren had academic exchanges with members of the CNERC-Rail and visited the CNERC-Rail Laboratory.


Seminar by Prof. Ching-Lung Liao from Taiwan University

On 14 January, 2019, Prof. Ching-Lung Liao, Director of the Track Technology Research Centre in the Department of Civil Engineering at Taiwan University, visited the CNERC-Rail and gave a seminar on “The Application of Driving Recorder to Analyze the Rail Irregularity and the Vehicle Swing.” Then, Prof. Liao visited the CNERC-Rail Laboratory, accompanied by Centre members Dr. Su-Mei Wang and Mr. Yun-Ke Luo.

Seminar by Prof. Sami F. Masri from the University of South California, USA

On 17 January, 2019, Prof. Sami F. Masri, of the Department of Civil and Environmental Engineering and of the Aerospace and Mechanical Engineering at the University of Southern California (USC) in the USA, visited the CNERC-Rail and delivered a seminar entitled “Application of Some Approaches for the Modeling and Monitoring of Complex Nonlinear Systems.” Then, Prof. Masri and Prof. Yi-Qing Ni, Director of the CNERC-Rail discussed potential cooperation opportunities before visiting the CNERC-Rail Laboratory.


Seminar by Dr. Karina Goldman-Czapiewska from the Blue 21, Netherlands

On 18-19 February, 2019, Dr. Karina Goldman-Czapiewska, of the Blue 21 in Netherlands, visited the CNERC-Rail and delivered a seminar entitled “Very Large Floating Structures.” After the seminar, she had an academic discussion with Prof. Yi-Qing Ni, Director of the CNERC-Rail.


Seminar by Prof. Chien-Ming Wang from University of Queensland, Australia

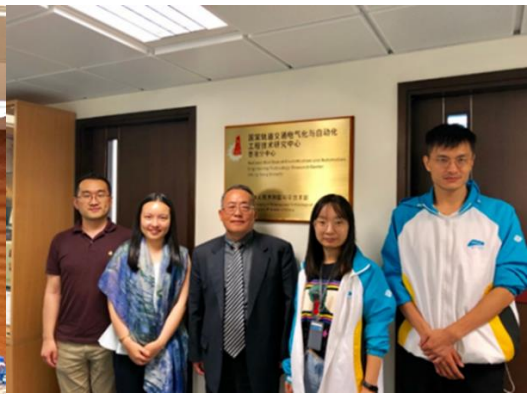
On 18-19 February, 2019, Prof. Chien-Ming Wang, of the Department of Civil Engineering at the University of Queensland (UQ) in Australia, visited the CNERC-Rail and gave a seminar on "Very Large Floating Structures." Prof. Wang had a discussion with Prof. Yi-Qing Ni on future cooperation opportunities before visiting the CNERC-Rail Laboratory.

Lecture Series on "Maglev Technology"

On 16-20 May, 2019, the CNERC-Rail invited experts and scholars to give lecture series on "Maglev Technology," including the Senior Engineer Mr. Zhi-Ming Liao, the Senior Engineer Mr. Jun-Qi Xu, Associate Professor Dr. Hong-Liang Pan, Dr. Wan-Ming Liu, Dr. Li-Jun Rong and Dr. You-Gang Sun, from the National Magnetic Maglev Transportation Engineering Technology Research Centre of Tongji University.

Seminar by Prof. Ming-Liang Wang from Northeastern University, USA

On May 27, 2019, Prof. Ming-Liang Wang, of the Northeastern University in the USA, visited the CNERC-Rail and gave a seminar entitled “Smart Infrastructure Systems–A Practical Platform for Continuous Network-Wide Health Monitoring of Transportation Infrastructures.” Then, Prof. Wang visited the CNERC-Rail Laboratory, accompanied by Centre members Dr. Su-Mei Wang and Mr. Chao Zhang.

Seminar on Rail Noise Controls

On 6 July, 2019, the China Hong Kong Railway Institution, Wilson Acoustics Limited and the CNERC-Rail jointly held a “CNERC Tour cum Retrofitting Rail Noise Controls Seminar”. Dr. Lu Zhou gave a brief introduction on research progress, research transformation achievements, and international cooperation and exchange of the CNERC-Rail. Dr. Masoud Sajjadi led the participants to visit the CNERC-Rail Laboratory and to observe the latest research and technological transformation achievements of the CNERC-Rail.


Seminar by Prof. Sheng-Guo Wang from University of North Carolina at Charlotte, USA

On 18 July, 2019, Prof. Sheng-Guo Wang, of the University of North Carolina (UNC) at Charlotte in the USA, visited the CNERC-Rail and gave a seminar on "Novel Lyapunov-Type Functional for Robust Control of General Time-Varying Delay Stochastic Uncertain Systems." Then, Prof. Wang visited the recent research and technology transfer products developed by the CNERC-Rail in the CNERC-Rail Laboratory.

Seminar by Prof. Sami F. Masri from University of Southern California, USA

On 20-24 July, 2019, Prof. Sami F. Masri, of the University of Southern California (USC) in the USA, visited the CNERC-Rail and gave a seminar entitled "Structural Vibration Control of Nonlinear Dynamic Systems." After the seminar, Prof. Masri visited the Structural Laboratory of the PolyU and the Laboratory of the PolyU-Shenzhen Research Institute, accompanied by Centre members Dr. Masoud Sajjadi, Dr. Chih-Shiuan Lin and Mr. Yun-Ke Luo.

Seminar by Prof. Guo-Quan Wang from University of Houston, USA

On 25 July, 2019, Prof. Guo-Quan Wang, of the University of Houston in the USA, visited the CNERC-Rail and gave a seminar on “Land Subsidence and Faulting Monitoring in Houston, Texas, USA.” Prof. Wang then visited the CNERC-Rail Laboratory and visited the latest research and technology transfer deliverables of the CNERC-Rail accompanied by Dr. Lu Zhou.

Seminar by Prof. Jian Guo from Zhejiang University of Technology

On 15 August, 2019, Prof. Jian Guo, Deputy Dean of the Department of Civil Engineering and Director of the Institute of Bridge Engineering at the Zhejiang University of Technology, visited the CNERC-Rail and gave a seminar entitled “Safety Assessment of Cross-sea Bridges under Multi-source Factors Causing Disaster”.

Seminar by Prof. Gang-Bing Song from University of Houston, USA

On 4 October, 2019, Prof. Gang-Bing Song, Director of the Laboratory of Intelligent Materials and Structures in the Department of Mechanical Engineering at the University of Houston in the USA, visited the CNERC-Rail and gave a seminar entitled “Connection Monitoring.” Then, Prof. Song visited the latest research and technological transformation achievements displayed in the CNERC-Rail Laboratory with guidance by Dr. Lu Zhou, Dr., Su-Mei Wang and Mr. Yang Lu.

Visiting Scholars & Delegations

Visit by Prof. Gang Chen from Massachusetts Institute of Technology, USA

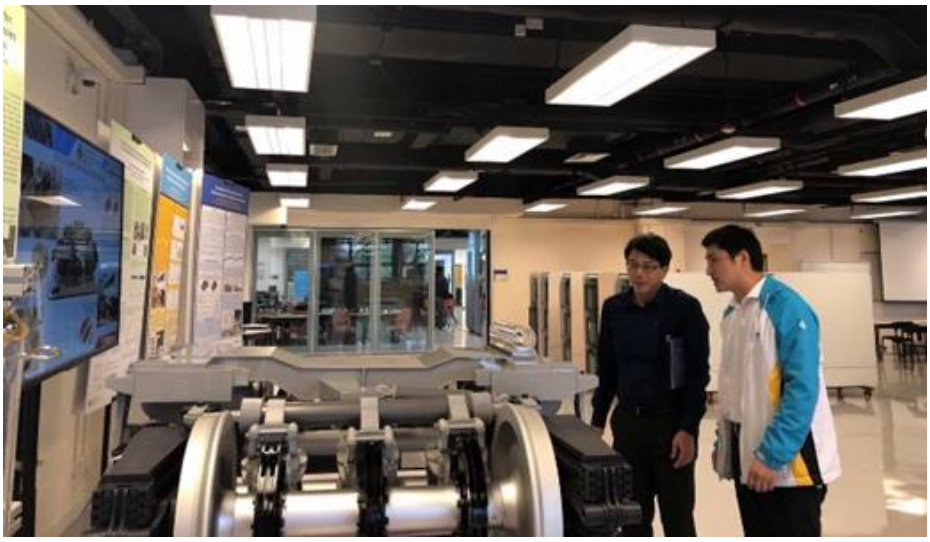
On 15 January 2019, Prof. Gang Chen, Head of the Mechanical Engineering Department, Massachusetts Institute of Technology, USA, paid a visit to CNERC-Rail. Pro. Guohua Chen, Associate Vice President (Research Support), Prof. Xiang-dong Li, Director of Research Institute for Sustainable Urban Development from PolyU, including Prof. Yi-Qing Ni, Director of CNERC-Rail, had a meeting with Prof. Gang Chen. Prof. Ni first introduced the latest technology development and research projects of CNERC-rail to Prof. Chen, then delivered a short presentation on “on-board monitoring and detection for railway system”. Subsequently, Prof. Ni and Centre member Dr. Siu-kai Ken Lai, invited Prof. Chen to visit the Centre’s laboratory.

Visit by Prof. Joanna Poon from University of Derby, UK

On 23 January 2019, Dr. Joanna Poon, Head of Built Environment within the College of Engineering and Technology, visited CNERC-Rail. Centre members Dr. Yan-Jie Zhu and Dr. Xiao-Zhou Liu welcomed Dr. Poon and gave her a tour of the Centre’s laboratory.

Visit by Prof. Yung-Cheng Lai from National Taiwan University

On 13 February 2019, Prof. Yung-Cheng Lai, from Department of Civil Engineering, National Taiwan University, visited PolyU, and was invited to visit the Centre's laboratory with the accompany of Centre members Dr. Yun-Lai Zhou. Dr. Zhou introduced the latest research development of CNERC-Rail to Prof. Lai. Then two parties had an in-depth discussion on the potential collaborative research fields.



Delegation from Zhejiang University

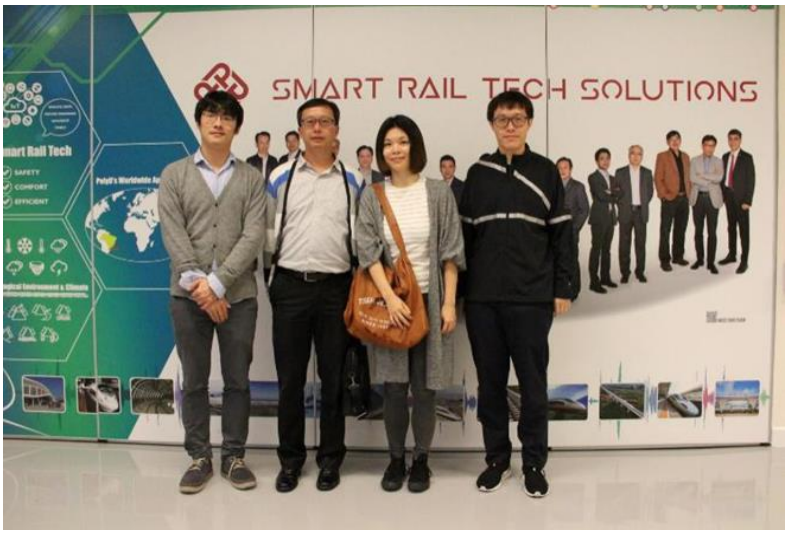
On 19 February 2019, a delegation made up of more than 20 undergraduates and teaching staffs from Zhejiang University paid a visit to CNERC-Rail. Centre member Mr. Yang Lu gave the visitors a tour of the Centre's laboratory and introduced the Centre's latest research development.

Delegation from Guangdong Electric Power Design Institute of China Energy Engineering Group Co., Ltd.

On 28 February 2019, a delegation from China Energy Engineering Group Guangdong Electric Power Design Institute Co., Ltd paid a visit to CNERC-Rail. Centre members Dr. Songye Zhu, secretary of CNERC-Rail and Mr. Tai-Tung Wai gave a warm welcome and introduced the latest technologies of Centre to the delegation.

Visit from Electrical and Mechanical Services Department, Hong Kong

On 6 March 2019, Ms. Yin-Yan Hung and Mr. Chi-Kin Chan from Hong Kong Electrical and Mechanical Services Department (EMSD), visited CNERC-Rail. Dr. Songye Zhu, Dr. Lu Zhou, Dr. Xiao-Zhou Liu, three Centre members and Dr. Victor Zhao, Assistant Director of PolyU Innovation and Technology Development, had a meeting with the two guests. During the meeting, both parties had an in-depth discussion on collaboration on research in multiple fields related to Hong Kong Metro, especially testing and monitoring techniques on future Hong Kong Metro lines.

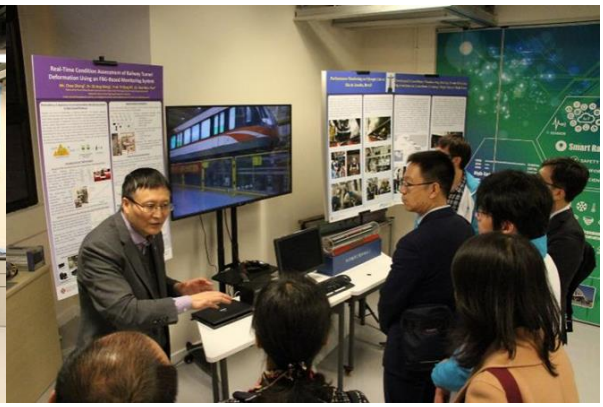


Delegation from China Academy of Railway Sciences

On 7 March, 2019, Prof. Dao-An Niu, Vice President of the China Academy of Railway Sciences (CARS), led a delegation to visit the PolyU and had a meeting with Prof. Yi-Qing Ni et al. at the PolyU-Shenzhen Research Institute. The two sides discussed potential technology corporations on the life-cycle monitoring, maintenance and management optimization for railway infrastructure. A broad consensus was researched and a solid foundation for further cooperation was laid. Dr. You Dong, Dr. Lu Zhou, Dr. Jin Guo, Dr. Xiao-Zhou Liu, Mr. Qiu-Hu Zhang, Mr. Chi Xu and Mr. Si-Xin Chen attended this meeting.

Delegation from China Science and Technology Exchange Centre

On 14 March 2019, a delegation from China Science and Technology Exchange Centre led by the Vice Head Ms. Cheng Wu, and accompanied by Mr. Yu Huang, Vice Director of Department of Education and Consultant, Science and Technology of the LOCPG, and Ms. Hiu-Tung Fung, Assistant Manager (Policy and Development) of Innovation and Technology Bureau in Hong Kong, visited PloyU. The delegation was warmly welcomed by PolyU' team led by Prof. Kwok-Yin Wong, Associate Vice President (Research Support), including Ms. Xuan Luo, Chinese Mainland Affairs Office, and Prof. Yi-Qing Ni, Director of CNERC-Rail. After the meeting, the delegation was invited to visit the Centre's laboratory.



Visit by Prof. Clive Roberts from University of Birmingham, UK

On 26 March 2019, accompanied by Dr. Edd Stewart, Prof. Clive Roberts, Head of School of Engineering and Director of the Birmingham Centre for Railway Research and Education, visited CNERC-Rail and had a meeting with Centre members. Two parties had an in-depth discussion on railway monitoring and data processing techniques.

Visit by Secondary School Students for HKIE Engineer Day

On 13 April 2019, The Hong Kong Institution of Engineers - The HKIE Engineer Day organized by The Hong Kong Institution of Engineers was held in PolyU. Hundreds of Hong Kong secondary school students attended the event. Prof. Yi-Qing Ni, Director of CNERC-Rail, was particularly invited to deliver a presentation on “Structural health monitoring of railway systems” to the students. Subsequently, Centre members introduced the Centre’s recent research development to the students.

Visit by China Resources (CR-Micro)

On 14 May 2019, Mr. Guo-Yi Wu and Zhen-Yu Liu, Director of Department of Strategy and Director of Department of Science and Energy, China Resources Microelectronics Limited, visited PolyU and the Centre's laboratory. Centre members Dr. Lu Zhou and Mr. Si-Qi Ding had a meeting with the guests. During the meeting, Dr. Zhou and Mr. Ding introduced the Centre's latest research projects and technologies to the guests. Two parties also had an in-depth discussion on the possible collaboration on research technologies and application in practice.

Delegation from University of Tun Hussein Onn Malaysia

On 12 June 2019, a delegation from University of Tun Hussein Onn Malaysia paid a visit to PolyU. The delegation was invited to visit the Centre's laboratory. Centre members Dr. Ruo-Lin Wang and Dr. Lu Zhou received the delegation and introduced the latest research projects and technologies of Centre to the delegation.

Visit by Prof. Cheng Su from South China University of Technology

On 12 June 2019, Prof. Cheng Su from School of Civil Engineering & Transportation, South China University of Technology visited CNERC-Rail. Centre members Dr. Ruolin Wang, Dr. Jin Guo, Dr. Su-Mei Wang and Mr. Ran Chen warmly welcomed Prof. Su and brought him to visit the Centre's laboratory.

Visit by Chairman of Council of Hong Kong Polytechnic University

On 25 June 2019, Mr. Tze-Ching Chan, Chairman of Council of Hong Kong Polytechnic University, accompanied by other Council members, visited PolyU Industrial Centre. Prof. Yi-Qing Ni, Director of CNERC-Rail was invited to brief on the latest research development and technologies of CNERC-Rail. Prof. Ni also accompanied the guests to visit the Centre's laboratory, also accompanied by Prof. Alexander Wai, Vice President (Research Development) of PolyU.

Delegation from Guangzhou University

On 27 June 2019, a team from the School of Civil Engineering of Guangzhou University visited PolyU and CNERC-Rail. Centre Member Dr. Lu Zhou hosted and accompanied the team to visit the Centre's laboratory. In the visit, Dr. Zhou introduced the Centre's equipment, the latest research projects and the latest technologies to the visiting team.

Delegation from Mass Rapid Transit Authority of Thailand

On 16 July 2019, a delegation from Mass Rapid Transit Authority of Thailand visited PolyU and the Centre's laboratory. Centre members Dr. Chih-Shiuan Lin and Dr. Masoud Sajjadi accompanied the delegation to visit the Centre's laboratory. During the tour, Dr. Lin and Dr. Sajjadi explained the research projects and technologies of Centre to the delegation.

Visit from CASICloud-Tech Co., Ltd.

On 24 July 2019, Mr. Liang Yu, Chairman of CASICloud -Tech Co.,Ltd. led a delegation to visit PolyU. Prof. Guo-Hua Chen, PolyU Associate Vice President (Research Support), Prof Yi-Qing Ni, Director of CNERC-Rail and Dr. Songye Zhu, Secretary of CNERC-Rail, received and warmly welcomed the delegation. The delegation was invited to visit the Centre's laboratory with the accompany of Prof. Ni. In the visit, Prof. Ni briefed the latest research development in railway engineering to the delegation.

Delegation from College of Electrical Engineering, Zhejiang University

On 29 July 2019, a team of undergraduates and academic staffs from College of Electrical Engineering Zhejiang University, led by Prof. You-Tong Fang, Deputy Dean of China Academy of West Region Development and Director of Research Centre for High-speed Railway, Zhejiang University. Prof. Yi-Qing Ni, Director of CNERC-Rail and Dr. Lu Zhou, Research Assistant Professor, explained the latest Centre's research developments to the visiting team.

Visit from Huawei International Co., Ltd., (Hong Kong)

On 29 July 2019, Ms. Yan-Yi Wu and Mr. Ling-Zhi Huang, Manager of Enterprise Business Department and staff of Enterprise Data Centre Solutions and Sales Department of Huawei International Co., Ltd. (Hong Kong) visited CNERC-Rail. Centre members Dr. Su-Mei Wang, Mr. Chao Zhang and Mr. Yang Lu had a meeting with the visiting guests. During the meeting, both sides explored collaboration opportunities in the areas of the applications of Cloud service technology, artificial intelligence and big data technology to rail transportation. A preliminary detailed collaboration plan was also agreed during the meeting.

Delegation from School of Electrical Engineering, Southwest Jiaotong University

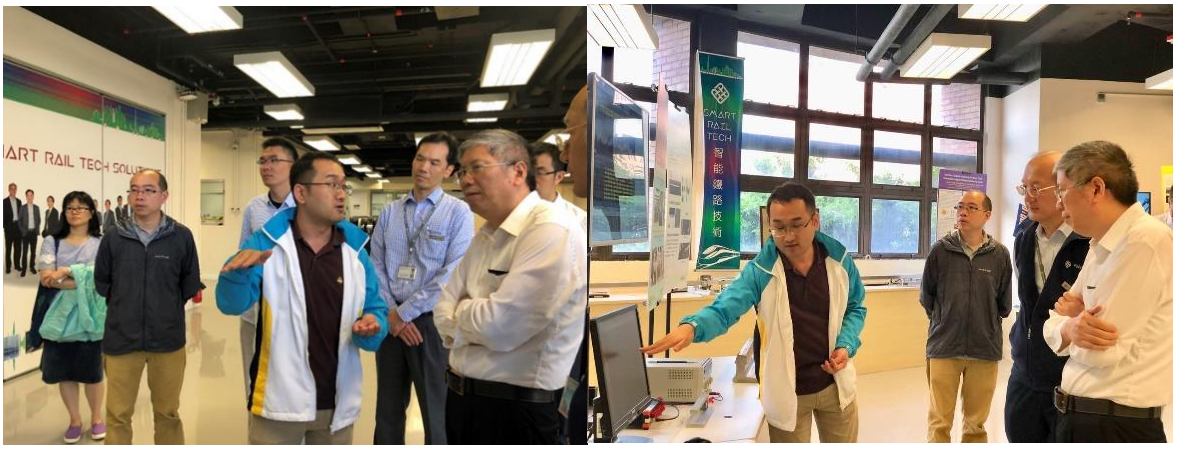
On 18 August 2019, led by Prof. Lei Ma, Deputy Dean, a delegation from School of Electrical Engineering, Southwest Jiaotong University, visited CNERC-Rail. Centre members Dr. Ruo-Lin Wang, Dr. Su-Mei Wang, Dr. You-Wu Wang and Mr. Chao Zhang had a meeting with the delegation. During the meeting, both sides exchanged the ideas and knowledge of applications of monitoring data and artificial intelligence algorithms to railway systems.

Delegation from Beijing University of Technology

On 22 August 2019, Prof Shun-Jun Chen, Dean of College of Mechanical Engineering and Applied Electronics Technology, Beijing University of Technology, led a delegation to visit CNERC-Rail. Centre members Dr. Siu-Kai Lai, Mr. Yang Lu and Mr. Tai-Tung Wai received the delegation and subsequently gave the delegation a tour of the Centre's laboratory.

Delegation from China Academy of Space Technology (CAST)

On 22 August 2019, Mr. Zheng-Feng Zhang, Chief Commander of Chang'e V and Dean of China Academy of Space Technology (CAST), and Mr. Pei Zhang, Researcher and Senior Engineer in Department of Integrative System Design paid a visit to PolyU and CNERC-Rail. Centre member Mr. Yang Lu briefly introduced the Centre's recent research to the visitors and accompanied them to visit the Centre's laboratory.



Appendix

Appendix I Timeline of Activities

No.	Date	Activities	Place
1	2019/1/2	Visit to visit Hunan Maglev Transportation Development Co., Ltd.	Hunan, China
2	2019/1/3	Discussion with members from National Maglev Transportation Technology Research Centre of Tongji University	Hunan, China
3	2019/1/3	Visit to CRRC Zhuzhou Electric Locomotive Co., Ltd.	Hunan, China
4	2019/1/7	Seminar by Prof. Wei-Xin Ren from Hefei University of Technology	PolyU, Hong Kong
5	2019/1/9-11	Visit to China Academy of Railway Sciences	Beijing, China
6	2019/1/11	The 1st council and technical committee meeting of the Guangdong-Hong Kong-Macau Greater Bay Area Rail Transit Joint Innovation Union	Shenzhen, China
7	2019/1/14	Seminar by Prof. Ching-Lung Liao from Taiwan University	PolyU, Hong Kong
8	2019/1/15	Visit by Prof. Gang Chen from Massachusetts Institute of Technology, USA	PolyU, Hong Kong
9	2019/1/17	Seminar by Prof. Sami F. Masri from the University of South California, USA	PolyU, Hong Kong
10	2019/1/23	Visit by Prof. Joanna Poon from University of Derby, UK	PolyU, Hong Kong
11	2019/1/23	Prof. Alexander Wai, Vice President (Research & Development) of PolyU and Prof. Yi-Qing Ni, Director of CNERC-Rail were interviewed by Hong Kong Press	PolyU, Hong Kong
12	2019/1/28	Visit to CRRC Qingdao Sifang Locomotive & Rolling Stock Co., Ltd.	Qingdao, China
13	2019/2/13	Visit by Prof. Yung-Cheng Lai from Taiwan University	PolyU, Hong Kong
14	2019/2/19	Seminar by Prof. Chien-Ming Wang from University of Queensland, Australia	PolyU, Hong Kong
15	2019/2/19	Seminar by Dr. Karina Goldman-Czapiewska from the	PolyU, Hong Kong

		Blue 21, Netherlands	
16	2019/2/19	Visit by delegation from Zhejiang University	PolyU, Hong Kong
17	2019/2/21	Visit to Suzhou Rail Transit Group Co., Ltd.	Suzhou, China
18	2019/2/28	Visit by delegation from China Energy Engineering Group Guangdong Electric Power Design Institute Co., Ltd.	PolyU, Hong Kong
19	2019/3/6	Visit by Ms. Yin-Yan Hung and Mr. Chi-Kin Chan from Electrical and Mechanical Services Department, Hong Kong	PolyU, Hong Kong
20	2019/3/7	Visit by delegation from China Academy of Railway Sciences	Shenzhen, China
21	2019/3/13	Prof. Yi-Qing Ni, Director of CNERC-Rail attended the meeting on national key program on research & development	Hong Kong SAR
22	2019/3/13	Visit to Shenzhen Metro Group Co. Ltd.	Shenzhen, China
23	2019/3/14	Visit by delegation from China Science and Technology Exchange Centre	PolyU, Hong Kong
24	2019/3/19-20	The 21st Asian Pacific Rail Conference	Hong Kong SAR
25	2019/3/21	The First Workshop on Guangdong-Hong Kong-Macao Greater Bay Area Maglev and Advanced Rail Transport Development	PolyU, Hong Kong
26	2019/3/26	Visit by Prof. Clive Roberts and Dr. Edd Stewart from University of Birmingham, UK	PolyU, Hong Kong
27	2019/4/3	Prof. Yi-Qing Ni, Director of CNERC-Rail attended the 2nd meeting on development of Guangming District of Science	Shenzhen, China
28	2019/4/10-12	Centre member Dr. Lu Zhou attended Rail Solutions Asia Show 2019	Kuala Lumpur, Malaysia
29	2019/4/12	Signed MoU with the Qingdao West Coast New Area Government	PolyU, Hong Kong
30	2019/4/13	Prof. Yi-Qing Ni, Director of CNERC-Rail attended the HKIE Engineer Day and delivered a presentation	PolyU, Hong Kong
31	2019/4/16	Visit to Guangzhou Metro Group Co., Ltd.	Guangzhou, China
32	2019/4/23	Visit to BISA Technologies Ltd.	Shenzhen, China

33	2019/4/26	Visit by Qianhai Inno-Tech Investment Co., Ltd.	PolyU, Hong Kong
34	2019/4/27	Workshop on Structural Health Monitoring System for SMART Infrastructure and Buildings	PolyU, Hong Kong
35	2019/5/14	Visit by China Resources Microelectronics Co., Ltd.	PolyU, Hong Kong
36	2019/5/16-20	Lecture Series on “Maglev Technology”	PolyU, Hong Kong
37	2019/5/27	Seminar by Prof. Ming-Liang Wang from Northeastern University, USA	PolyU, Hong Kong
38	2019/6/12	Visit by delegation from University of Tun Hussein Onn Malaysia	PolyU, Hong Kong
39	2019/6/25	Visit by PolyU Council Chairman Mr. Tze-ching Chan	PolyU, Hong Kong
40	2019/6/27	Visit by delegation from Guangzhou University	PolyU, Hong Kong
41	2019/7/6	Seminar on Rail Noise Controls with Wilson Acoustics Co., Ltd.	PolyU, Hong Kong
42	2019/7/16	Visit by delegation from Mass Transit System of Thailand	PolyU, Hong Kong
43	2019/7/18	Seminar by Prof. Sheng-Guo Wang from University of North Carolina at Charlotte, USA	PolyU, Hong Kong
44	2019/7/22	Seminar by Prof. Sami F. Masri from University of Southern California, USA	PolyU, Hong Kong
45	2019/7/24	Visit by delegation from CASICloud-Tech Co., Ltd.	PolyU, Hong Kong
46	2019/7/25	Seminar by Prof. Guo-Quan Wang from University of Houston, USA	PolyU, Hong Kong
47	2019/7/29	Visit by delegation from College of Electrical Engineering, Zhejiang University	PolyU, Hong Kong
48	2019/7/29	Visit by delegation from Huawei International Co., Ltd., (Hong Kong)	PolyU, Hong Kong
49	2019/8/4-7	The 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure	Saint Louis, USA
50	2019/8/15	Seminar by Prof. Jian Guo from Zhejiang University of Technology	PolyU, Hong Kong
51	2019/8/18	Visit by delegation from School of Electrical Engineering, Southwest Jiaotong University	PolyU, Hong Kong
52	2019/8/22	Visit by delegation from Beijing University of Technology	PolyU, Hong Kong

53	2019/8/22	Visit by delegation from China Academy of Space Technology	PolyU, Hong Kong
54	2019/8/23-26	Prof. Yi-Qing Ni, Director of CNERC-Rail attended the 10th Cross-strait Summer School on Monitoring and Control in Civil Engineering	Wuhan, China
55	2019/8/30	Prof. Yi-Qing Ni, Director of CNERC-Rail attended the Guangdong Rail Transit Equipment Industry Development Conference	Jiangmen, China
56	2019/9/10-12	The 12th International Workshop on Structural Health Monitoring	California, USA
57	2019/9/11-13	The 17th International Probabilistic Workshop	Edinburgh, UK
58	2019/9/19	Visit by delegation from Wuyi University	PolyU, Hong Kong
59	2019/9/26	Prof. Yi-Qing Ni, Director of CNERC-Rail attended the Planning & Design and Cooperative Development of Modern Rail Transit Summit under the background of Guangdong-Hong Kong-Macao Greater Bay Area Policy	Shenzhen, China
60	2019/10/4	Seminar by Prof. Gang-Bing Song from University of Houston, USA	PolyU, Hong Kong
61	2019/10/18	Prof. Yi-Qing Ni, Director of CNERC-Rail attended the 2019 China International Rail Transit & Equipment Manufacturing Industry Exposition Zhuzhou Forum and delivered a speech	Hunan, China
62	2019/10/25	Prof. Yi-Qing Ni, Director of CNERC-Rail attended the 2019 International Conference on Electrical and Information Technologies for Rail Transportation & Intelligent Rail Transportation System Technology Development Forum	Qingdao, China
63	2019/11/15	Prof. Yi-Qing Ni, Director of CNERC-Rail attended the annual meeting of the Guangdong-Hong Kong-Macau Greater Bay Area Rail Transit Joint Innovation Union	Shenzhen, China
64	2019/11/21	The 3rd China High-Speed Railway Health Management Technologies	Beijing, China
65	2019/12/13	Prof. Yi-Qing Ni, Director of CNERC-Rail attended the technical leader meeting of the Guangdong-Hong Kong-Macau Greater Bay Area Rail Transit Joint Innovation Union	Shenzhen, China

Appendix II Media Reports

文匯 快訊 首頁 > 快訊 > 正文

港研智能雲平台助力中國軌道交通發展

2019-10-19

【文匯網訊】(香港文匯網記者 姚進)「大數據永遠不會撒謊，而且能夠全方位的搜集列車運行數據，從而在安全性、可靠性、舒適度等方面優化軌道交通發展。」10月18日下午，在2019中國國際軌道交通和裝備製造產業博覽會株洲論壇上，香港理工大學教授、國家軌道交通電氣化與自動化工程技術研究中心香港分中心主任倪一清發表了主題為「智能鐵路：傳感器技術與人工智能的融合」的主旨演講。

中新網 视频
www.chinanews.com

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专家建议香港建设跨境磁悬浮项目 实现"轨道上的大湾区"

分享到:

发布时间：2019年03月21日 16:39 来源：中国新闻网

第一届粤港澳大湾区磁浮列车与先进轨道交通发展研讨会

（2019年3月21日，中国香港）

The First Workshop on Guangdong-Hong Kong-Macao Greater Bay Area Maglev and Advanced Rail

CHINA DAILY | HONG KONG EDITION | Friday, March 22, 2019

TOP NEWS

Experts call for rail upgrade in Bay Area

By HE SHUSI in Hong Kong

香港举办研讨会交流大湾区磁浮交通战略

2019年03月22日08:20 来源：人民网－人民日报海外版

本报香港3月21日电 （记者陈然）由香港理工大学、西南交通大学、人民出版社及粤港澳大湾区现代轨道交通协同创新中心联合主办的“第一届粤港澳大湾区磁浮列车与先进轨道交通发展研讨会”21日在香港隆重举行，近百名两地轨道交通专家及学者出席，就磁浮交通战略在城市轨道交通领域的发展进行深入交流。

中央人民政府驻香港联络办公室副主任谭铁牛致辞时说，随着中国科技水平的飞跃发展，磁悬浮技术和高速铁路技术即以广泛应用，为香港庞大湾区内的交通运输系统建设带来先进可靠的广阔前景。

香港理工大学副校长卫炳江表示，期中此次研讨会可聚集磁浮列车与先进轨道交通技术的快速发展，为构建粤港澳大湾区互联互通、快速便捷的一体化轨道交通体系提供最新发展，包括勘探建造、牵引供电系统、列控系统等。

中央人民政府驻香港特别行政区联络办公室

谭铁牛出席第一届粤港澳大湾区磁浮列车与先进轨道交通发展研讨会

来源：中央政府驻港联络办　发布时间：2019-03-22

中国新闻网

第一届大湾区轨道交通发展研讨会在港举行

2019年03月21日 16:15 来源：中国新闻网

原标题：第一届大湾区轨道交通发展研讨会在港举行 专家探讨建设多层次“轨道上的大湾区”

中新社香港3月21日电 (韩晨曦)第一届粤港澳大湾区磁浮列车与先进轨道交通发展研讨会21日于香港理工大学(理大)举行，近百名中国内地及香港的轨道交通专家学者出席，就磁浮交通战略在城市轨道交通的发展进行研讨交流。并提出建设“轨道上的大湾区”，在区内形成布局合理、功能完善、衔接顺畅、运作高效的多层次轨道交通网络。

理大副校长(科研发展)卫炳江致辞时表示，希望此次会议可以促进轨道交通技术在粤港澳大湾区的发展，构建粤港澳大湾区互联互通的一体化轨道交通体系，建设“轨道上的大湾区”。

当日，深圳大学教授、中国工程院院士杜彦良发表题为《大湾区一体化发展战略构想》的演讲。杜彦良认为，构建基于轨道上的大湾区交通会通一体化作为率先突破的节点，形成“干线铁路、城际铁路、市域快线、市内地铁”四层次轨道交通网络。

新华文化

文旅 文投 文艺 文创 非遗

第一届大湾区轨道交通

2019-03-22 09:09:09

第一届粤港澳大湾区磁浮列车与先进轨道交通发展研讨会2

学(理大)举行，近百名中国内地及香港的轨道交通专家学者出席，在城市轨道交通的发展进行研讨交流。并提出建设“轨道上的大湾区”，布局合理、功能完善、衔接顺畅、运作高效的多层次轨道交通网络

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晴報 News

串連港東大嶼及機場 時速600km

大灣區研建磁浮列車

半小時 直達各市

上海磁浮線 14年沒傷亡事故

中日磁浮前景

灣區交通一體 磁浮列車添力

兩地專家倡研跨域短途出行 建「軌道上的大灣區」

譚鐵牛勉兩地學者造福市民

從「跟跑」「並跑」到「領跑」

香港 新聞

2019年3月22日 星期五

Hong Kong Commercial Daily http://www.hkcd.com A13

港辦首屆灣區磁浮列車發展研討會

【香港商報訊】記者林駿強報道：第一屆粵港澳大灣區磁浮列車與先進軌道交通發展研討會，昨日於理工大學舉行。中聯辦副主任譚鐵牛表示，粵港澳大灣區是今年兩會的「關鍵詞」，而這是國家的重大戰略，香港在當中有很大的發展潛力與空間。他說，大灣區的重要任務之一是建設國際創科中心，而這又離不開交通，建設安全、便捷、智慧的交通很重要。他強調，高鐵香港段於去年通車是「歷史性事件」。理工大學副校長衛炳江稱，會抓住大灣區的發展機遇，聯合大灣區及區內外優秀高校，在國家科技發展的大戰略藍圖中有的角色。會上有多位專家分析國家區域發展。

譚鐵牛：灣區創科離不開交通

由理工大學、國家軌道交通電氣化與自動化工程技術研究中心香港分中心、西南交通大學、大灣基金等機構主辦的第一屆粵港澳大灣區磁浮列車與先進軌道交通發展研討會，昨早在理工大學舉行，並由中聯辦副主任譚鐵牛、西南交通大學校長仕錦、理工大學副校長(科研發展)衛炳江等主礦。

譚鐵牛致辭表示，一年一度的全國兩會剛閉幕不久，今年屬於不是逸屆年，兩會仍獲得外界高度關注。他說，國家在複雜的形勢下，依然取得非常好的發展，各界亦關注兩會在什麼方面與香港有關，並可以為香港帶來什麼「紅利」。他指出，粵港澳大灣區是今次兩會的「關鍵詞」。

譚鐵牛形容，粵港澳大灣區是國家的重大戰略，是可以豐富「一國兩制」的新內涵。他分析稱，香港在當中有很大的發展潛力，也有很大的發展空間。他說，大灣區的重要任務之一，是要建設國際創科中心，這是重中之重，國家會大力推動內地與香港在創科方面的合作。他引申說，要做到這目標，其實都離不開交通，而建設安全、便捷、智慧的交通很重要。他強調，去年高鐵香港段通車是「歷史性事件」，顯見軌道交通可為老百姓帶來便利。

衛炳江：建構一體化軌道體系

衛炳江會上指出，隨着廣深港高鐵香港段於去年通車，理大會抓住大灣區的發展機遇，充分發揮「一國兩制」及國際化優勢，聯合大灣區及區內外優秀高校，在國家科技發展的大戰略中擔當應有的角色。他希望最次近期可推進磁浮列車與先進軌道交通技術在大灣區的發展，建構出大灣區互聯互通、快速便捷的一體化軌道交通體系，建設「軌道上的大灣區」。

亦有多位嘉賓於會上作分享。中國工程院院士魏德

中聯辦副主任譚鐵牛(左六)、理工大學副校長衛炳江(右四)等多名嘉賓為研討會主禮。

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

National Rail Transit Electrification and Automation Engineering Technology Research Center (Hong Kong Branch)
國家軌道交通電氣化與自動化工程技術研究中心(香港分中心)

媒体报道

香港 新聞

國家科技部批准 研高鐵及鋼材技術

理大設國家級科研中心

擺正牌「科水」 利洽談合作

倪一清指「過河」意義重大 料外界信心興趣大增

理大建兩國家級工程中心

國家科技部批准成立 研高鐵工程及鋼結構

倪一清：智能化守護高鐵安全

大公資訊

国家两工程中心 理大设分支

港研光纖傳感器「把脈」輪軌勞損

倪一清：智能化守護高鐵安全

理大研究團隊受託赴巴西　監測奧運線地鐵列車營運性能 (18:51)

【里約奧運】理大獲委託監測奧運地鐵

2016年08月05日(五) 20:16

理大團隊利用自主研發的光纖光柵傳感技術，針對地鐵列車上的結構部件動力性能進行監測。 1/6

奧運將於本港時間明日早上開幕，本港除派遣運動員赴當地外，香港理工大學亦獲委託負責在當地行駛奧運村的地鐵開通前，監測地鐵列車的性能。這條負責接載奧運選手及觀眾來往巴西里約熱內盧市區與奧林匹克村的地鐵線，已於上月三十日開通營運，全長十六公里，時速可達一百公里，單列載客量可達二千二百四十人。

表2：國家工程技術研究中心香港分中心一覽表

申請單位	國家工程技術研究中心香港分中心名稱	香港分中心主任名稱	成立年份
香港應用科技研究院	國家專用集成電路系統工程技術研究中心香港分中心	湯復基博士	2012
香港理工大學	國家鋼結構工程技術研究中心香港分中心	蔣國輝教授	2015
香港理工大學	國家軌道交通電氣化與自動化工程技術研究中心香港分中心	倪一清教授	2015
香港城市大學	國家貴金屬材料工程技術研究中心香港分中心	呂堅教授	2015
香港科技大學	國家人體組織功能重建工程技術研究中心香港分中心	唐本忠教授	2015
香港科技大學	國家重金屬污染防治工程技術研究中心香港分中心	陳光浩教授	2015

THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學

National Rail Transit Electrification and Automation Engineering Technology Research Center (Hong Kong Branch) 國家軌道交通電氣化與自動化工程技術研究中心（香港分中心）

获香港特区政府研究资助局2018至2019年度研究影响基金

Enhancing safety, punctuality and ride comfort of railway transportation: From local metro system to global high-speed rail network

(保障铁路系统安全性、准时性及舒适度技术与方法研究：从城市地铁系统到全国高铁网络)

4 | Monday, January 28, 2019 CHINA DAILY | HONG KONG EDITION

CHINA TOP NEWS

Hong Kong innovation to make rail travel safer

By WANG FENG in Hong Kong
wangfeng@chinadailyhk.com

Prof Ni Yiqing (left), team member Derek Or Siu-wing (right) and Alex Wai Ping-kong, vice-president of PolyU, explain their project awarded by the Research Impact Fund. WANG FENG / CHINA DAILY

A world-changing technology being incubated in Hong Kong promises to make rail travel safer for passengers.

cables, which Ni described as pioneering. "It's (a matter of) knowing immediately which of 12 pairs of wheels on a train have cracked

longer range and higher speed.

"We hope the research can help turn the traditional railway indus into one that's modern and sma

大公報

電郵：tkpnews@takungpao.com.hk 傳真：2834 5104 責任編輯：陳紀瑩 美術編輯：蕭潔景

2019年1月28日 星期一

理大獲6000萬資助研智慧鐵路

【大公報訊】記者郭詠遇報

大學有十個科研項目獲2018/19年

金撥款，其中與智慧城市有關的

於香港東鐵及新加坡取得列車車

，並在試行中獲得不俗成績。理

研發展）衛炳江表示，期望未來

用於高鐵等國家級列車上。

▶衛炳江期望研發可應用於國家級列車 大公報記者

hket 港聞 Local News

2019年1月28日 星期一

理大研「智慧鐵路」 冀減故障延誤

A21 新聞透視

研究影響基金 理大獨佔三成

首批撥款1.93億元助30項目 「智慧城市」「民生/健康」獲撥款

理大兩聯合實驗室揭幕

教育

首屆「研究影響基金」理大項目佔1/3

健康智慧城市各半 10項共獲撥逾6000萬

東方日報

2019.01.28 星期一

理大獲撥款600萬 研智能鐵路系統

【本報訊】鐵路系統講求安全、準時和 了解兩者磨損的過程 動。

舒適，卻易受不同因素如路軌設計 磁波

等因素影 電機工程學

與港鐵、 鐵路已電氣

合作研究 不穩定會影

度等，透 ，故研究以

鐵路系統 米納米塗層

作，獲研 被對環境及

六百萬元。

獲資助 加坡的鐵

時性及舒適 數據及測

鐵系統列全 轉移。衛

家軌道交通 本港六所

中心（香港 局研究影

表示，以港 十個獲撥款，共約六千五百萬元。

乘搭，期望 用新技術、 到安全、準時和舒適，中、長期目標則透過鐵路系統提升城市競爭力，及促進智能城市發展。

此研究共有六個項目，理大副校長（科研發展）衛炳江補充指，由於列車在路軌上行駛，長時間會產生磨耗，令車輪及路軌的接觸面改變，影響列車舒適及穩定，他們期望研究出列車車輪及路軌磨損的演變模式，分析車輪與路軌的接觸面，

■衛炳江（右起）、倪一清和柯少榮在高鐵轉向架模型前合照。 （胡家豪攝）

晴報 News

獲$600萬資助 理大夥城大研智慧鐵路助減故障

新設5間聯合實驗室

F1 二〇一九年一月二十八日 星期一

星島教育 SING TAO EDUCATION

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研究影響基金撥款590萬元

理大研發新技術 監測鐵路提升安全

鐵路運輸追求安全、準時及舒適，理工大學獲研究資助局研究影響基金撥款近五百九十萬元，研發多項保障鐵路系統技術與方法，包括研發自主供電的智能阻尼器，監察車輪光滑度系統，防止信號受電磁波干擾等技術，理大副校長（科研發展）衛炳江強調，相關研究不是針對導軌近年故障，而是要研發更先進的新一代技術。 記者 葛少倫

■理工大學獲研資助的研究影響基金撥款十個科研項目，包括研究提升鐵路安全、準時及舒適的新技術。 伍梓輝攝

項聯合實驗室揭幕

Appendix III Purchased Equipment

No.	Equipment Description	QTY
1	Weather Tramitter	1
2	16 Channel 50MHz simultaneous A/D converter Board system	1
3	Roraty CVD system, BTF-1200C-R-II-CVD	1
4	+17dBm Output Power C+L Band ASE Light Source	1
5	Fiber Bragg Grating accelerometer P/N AN-SSA-100	1
6	Fiber Bragg Grating accelerometer P/N AN-SSA-100HF	1
7	Optical Accelerometers and mountings	4
8	METROHM AUTOLAB PGSTAT302N Electrochemical workstation with FRA32M MODULE	1
9	GANTNER INSTRUMENTS data acquisition & signal conditioner system	1
10	Mono DAQ-E-ACC-4, IEPE & Voltage input & PoE power injector	3
11	PepWave industrial 4G router, Netgear portable router, Battery pack and accessories	1
12	ELA innovation active RFID sensors & relevant electronic circuits for DC voltage input	2
13	magnetorheological intelligent control system	2
14	Slam Stick 16g 3 axis accelerometer	1
15	HVA-800A Linear power amplifier for ultrasonic applications	1
16	Accelerometer, Wind sensor, inclometer, DAQ system & DAQ board	1
17	Slam Stick PR: 3141350 16g, 25g, 100g & 500g 3 axis accelerometers	4
18	Industrial PC for Data acquisition system	1
19	Supply and delivery of wireless sensor system for the existing Highspeed Railway Monitoring System (HRMS)	1
20	Long Stroke Shaker	1
21	YOKOGAWA AQ6370D-12-L1-Q/FC/RFC high precision grating-based	1

	optical spectrum analyzer	
22	Fabrication of 1 pair of alumninium railroad damper model	1
23	Provision of "irail" video system software for track rail condition monitoring	1
24	MOI si255 interrogator and Jumper cables	1
25	IEPE Multi-range Impact Hammer	1
26	Laurell Single Wafer Spin Processor	1
27	Gas Jet Manifold	1
28	Enhanced Sensitivity	1
29	Bare Fiber Holder, Dual Arm	1
30	High Resolution Micrometer	1
31	Climatic Material Test Chamber Model	1
32	Third Party Compression Platens	1
33	CO2 laser and Controller	1
34	High Performance Linear Stage	1
35	Metric Optical Table	1
36	Metric Mini Lab Jact	1
37	Premium Bif. Fiber	1
38	Auxiliary Table Kit-Horizontal & Vertical Imperial Threads	1
39	MonoDAQ-E-ACC-4	2
40	Supply and Install Rail Tuned Mass Dampers at Guangzhou in 2 Locations	1
41	DeweSoft option - Software License Upgarde DSA The DSA license is the perfect software solution for any & all digital signal processing	1
42	FBG accelerometers	30
43	Free-field Microphone	10
44	GPU computing servers	1
45	Anti-bending FBG sensors	100
46	Fibre optic interrogator	1
47	DAQ SIRIUSi-HD-16xACC	2

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