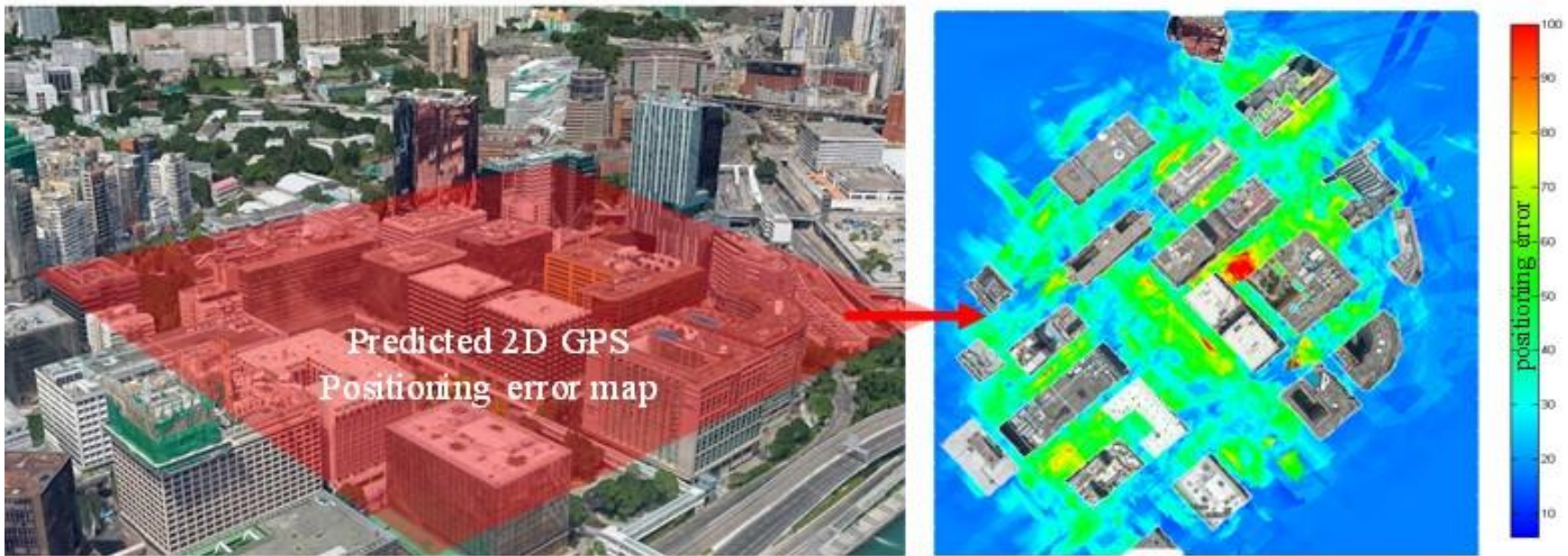


# Path Planning using the Predicted GPS Positioning Error Map for UAV

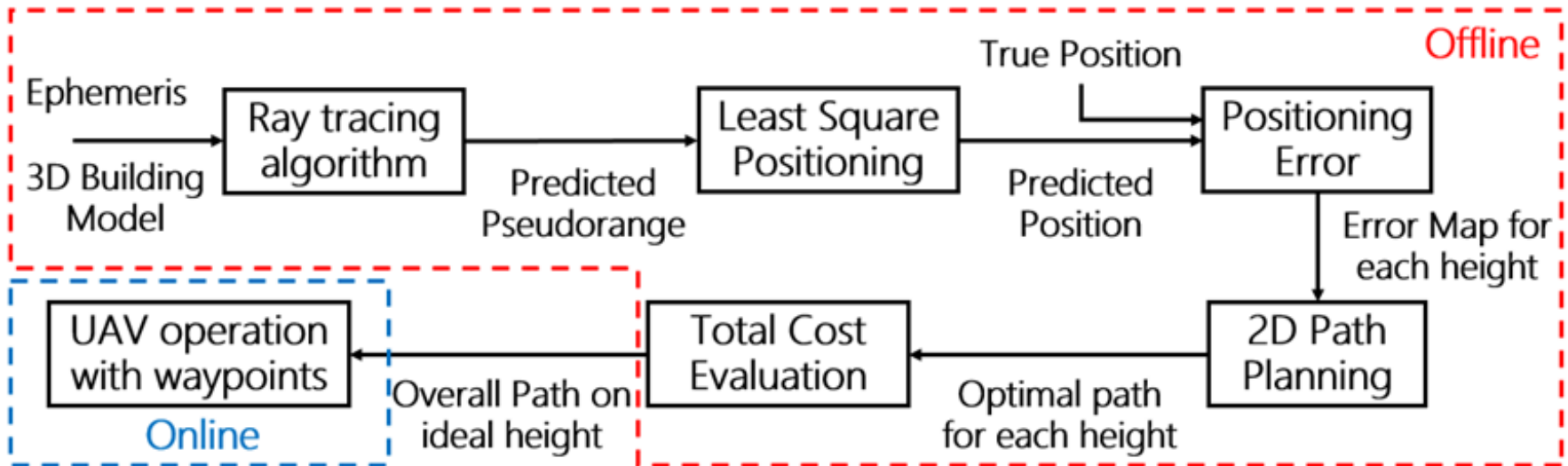
- Avoid the GPS positioning error area.
- Based on broadcasting Ephemeris, 3D building model and ray-tracing simulation , we can make a GPS error map.



Zhang G., Hsu, L.T.\* (2018) [A New Path Planning Algorithm Using GNSS Localization Error Map for UAV in Urban Area](#), Journal of Intelligent & Robotic Systems 94(1):219-235.



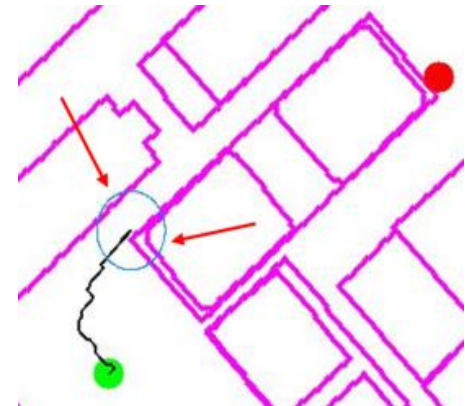
# System architecture of the UAV applying the proposed path planning method.



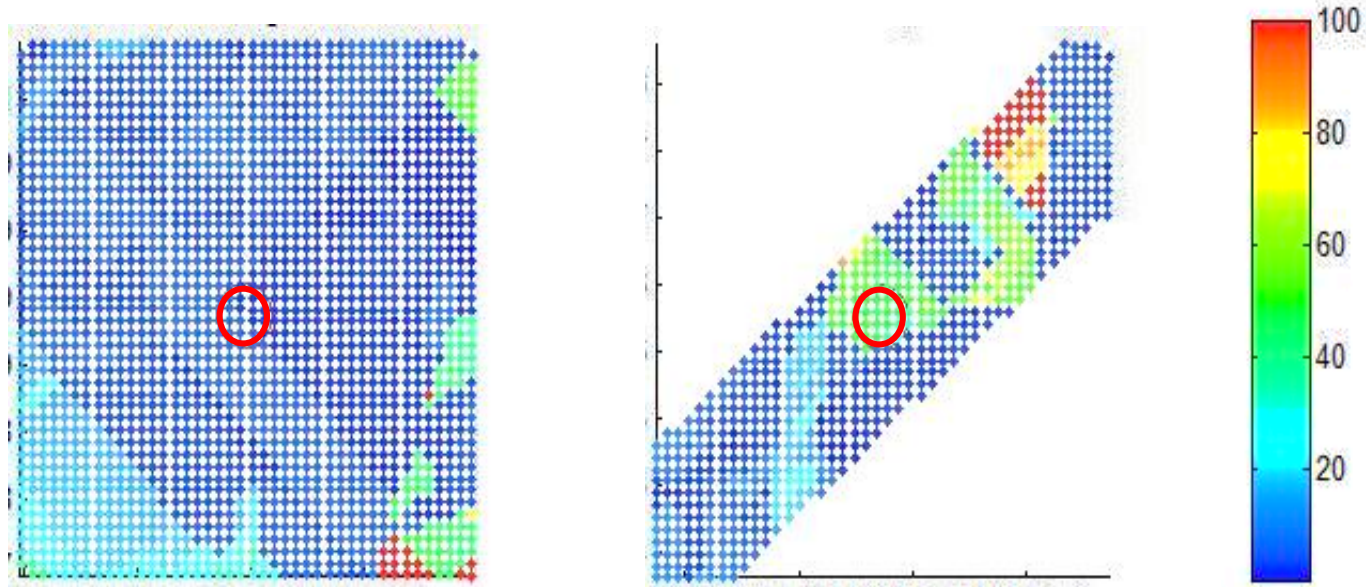
## Cost function of 2D Path planning

$$G(n) = [\|x_n - x_{n-1}\| + CP(n)] + G(n - 1)$$

number of contact points  $CP$ ,  $CP=2$  in this example



# Evaluation between simulation and experiment results



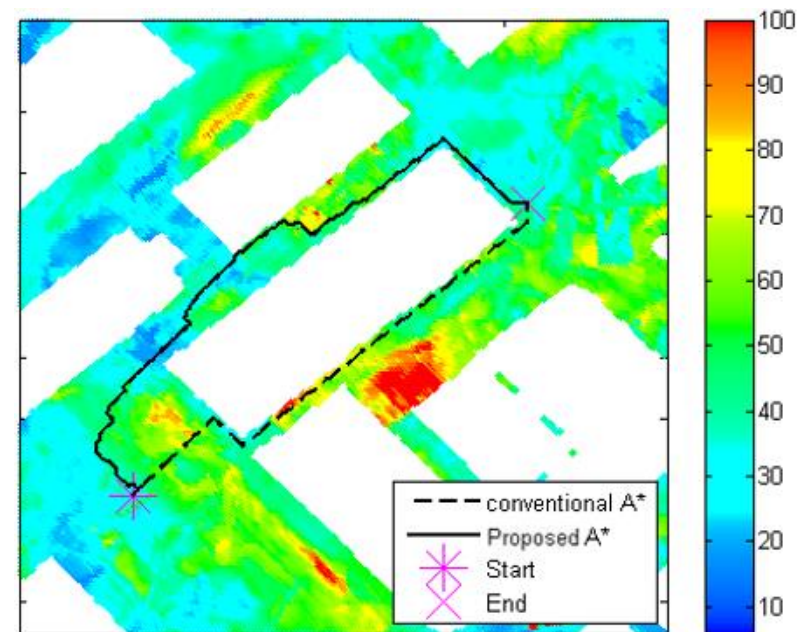
	Experiment		Prediction
	Mean error (m)	Max error (m)	Mean error (m)
<b>Intersection</b>	<b>6.38</b>	<b>32.62</b>	<b>5.25</b>
<b>Narrow canyon 1</b>	<b>24.68</b>	<b>61.81</b>	<b>42.33</b>
Open-sky area	2.64	4.74	0.01
Urban area 1	8.04	28.04	9.67
Urban area 2	14.79	43.53	15.64
Narrow canyon 2	43.05	137.85	42.34
Narrow canyon 3	47.35	76.36	49.06



# Path Planning using the Predicted GPS Positioning Error Map



## Planned Path of the proposed algorithm



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