Full Name (English):	**Xiaoyu Tang**	
Affiliated Institution and Title (English):	**South China Normal University** **Assoc. Prof.**	

Biography
(Please provide in paragraph form within 500 words.)

Tang Xiaoyu, an associate professor at South China Normal University, is the deputy dean of Xingzhi College and founder of the Robotics and IntelliSense Innovation Lab (RIS-LAB). He is also a master's supervisor, IEEE member, and CCF senior member. He obtained a bachelor's degree from the School of Physics at South China Normal University, master's degree from the School of Education at Sun Yat-sen University, respectively, and Ph.D. from the School of Physics at South China Normal University. His research focuses on image processing and intelligent control, artificial intelligence, and educational informatization..

He has presided over or participated in 10 projects funded by the National Natural Science Foundation and other organizations and has undertaken over 30 enterprise projects. He has published over 50 papers in domestic and international authoritative journals and conferences, such as IOTJ, JSET, TGRS, TMECH, TIM, SENJ, TALLI, and ICRA. He has also been granted 20 patents.

He has guided students in hosting over 10 key provincial projects, such as the Guangdong Province Science and Technology Innovation Special Projects. Under his guidance, students have won over 300 provincial and national awards in authoritative competitions, including the "Challenge Cup" National College Students' Innovation and Entrepreneurship Competition.

Speech Title (English):

The Research and Application of Low-altitude UAV Multi-source Collaborative Intelligent Systems

Speech Abstract
(Please provide in paragraph form within 500 words.)

With the continuous advancement of artificial intelligence (AI) and computer vision (CV) technologies, low-altitude unmanned aerial vehicles (UAVs) have increasingly exhibited lightweight and intelligent characteristics, becoming widely used in urban inspection tasks. The Robotics and IntelliSense Innovation Lab (RIS Lab) at South China Normal University focuses on overcoming the challenges of high-precision multi-modal remote sensing image fusion and recognition technology for UAVs and the optimization bottlenecks in emerging edge-cloud collaborative AI application mode. RIS Lab is dedicated to developing an efficient and intelligent UAV-based urban-rural inspection system, which has achieved significant results in various sectors, including urban and rural infrastructure, marine ecology, renewable energy, and agriculture assessment.

RIS Lab has built two related image datasets to address the problem of signal interference detection. The team pioneered the development of a lightweight antenna detector, YOLO-Ant, which combines CNN and Transformer architectures. The team also developed an AIoT system based on an optimized edge-cloud collaboration mode (ECC+) and an end-to-end signal interference source localization solution, facilitating the daily inspection work of communication department staff. Furthermore, the team proposed a road crack identification model YOLOv8-DS and a high-precision pothole instance segmentation method LEPS to enable real-time road damage detection. In response to the challenges of photovoltaic panel damage assessment, the team introduced a multi-task framework, MTCS, which significantly improves assessment efficiency by simultaneously performing instance segmentation of photovoltaic panels and counting the number of potholes on each panel with a single forward pass. The team developed a large-scale pest image dataset from various ecological environments and geographic regions for pest control in agriculture. It proposed a high-precision pest recognition algorithm, YOLO-Pest, and a more lightweight version, DAS. RIS Lab has proposed a multi-sensor collaborative observation network integrating UAVs in response to the national demand for marine ecological protection. By applying spatio-temporal multi-modal deep neural networks, the team established a dynamic biological membrane evolution model, achieving high-precision coastal ecological monitoring and future state prediction.