# An Invasive Target Detection and Localization Strategy Using Pan-tilt-zoom Cameras for Security Applications

**Jia Hu[1], Chuanshen Zhang[1,2], Sheng Xu[1,3*], Chunjie Chen[3,4]**

[1]Shandong Institute of Advanced Technology, Chinese Academy of Sciences, Shandong, 250102, China
[2]School of Physics Science and Information Techongy, Liaocheng University, Liaocheng, 252000, China
[3]Guangdong Provincial Key Lab of Robotics and Intelligent System, Shenzhen Institute of Advanced Technology, Shenzhen, 518055, China
[4]CAS Key Laboratory of Human-Machine Intelligence-Synergy Systems, Shenzhen Institute of Advanced Technology, Shenzhen, 518055, China

- This paper designs a practical security monitoring system to quickly detect and localize the invasive animals.
- To resolve the inaccurate and time-lag problems in the target recognition, a strategy combined with YOLOV5 and DeepSOPT is developed.
- Furthermore, an improved PID controller using particle swarm optimization (PSO) is proposed to control the PTZ for target localization.