Palash Yuvraj Ingle, Ph.D., Research Professor

palashngl@gmail.com / palashngl94@gmail.com
+8210-2447-2050 palash-ingle
https://palashngl.github.io/

Education

2020 – 2023 **Ph.D., Double Major, Security Engineering Lab.** Sejong University, South Korea.
Dept. (*Computer and Information Security, Convergence Engineering for Intelligent Drone)*
Thesis title: *Abnormal Object Video Synopsis in Multiview Cameras.*

2017 – 2019 **M.Tech. Computer Science and engineering,** YMCA University, India.
Thesis title: *Using Hand Gesture for Solving Mute Deaf Problem and Control 3D Printed Prosthetic Hand Model Using IoT.*

2014 – 2016 **M.Sc. Information Technology,** Mumbai University, India.
Thesis title: *UGCV-Unmanned Ground Counter-IED Vehicle.*

2011 – 2014 **B.Sc. Information Technology,** Mumbai University, India.
Project title: *Live online examination system.*

Additional Qualification

2023 – 2024 **CVDL Master Program,** Opencv University (Online).

2021 – 2022 **P.G.D in Artificial Intelligence and Machine Learning,** NIT Warangal (Online), India.

Employment History

2024 – till date **Research Professor,** Computer and Information Security, Convergence Engineering for Intelligent Drone, Sejong University, Seoul, South Korea.

2023 – 2024 **Postdoctoral Researcher,** Security Engineering Lab, Sejong University, Seoul, South Korea.

2020 – 2023 **Research Scholar,** Security Engineering Lab, Sejong University, Seoul, South Korea.

2017 – 2020 **Assistant Professor (fixed)** Information Technology Department, K.J Somaiya College, mumbai, India.

Subject Taught

2019-2020 **Graduate and Master Course:**Artificial Intelligence, Computer Forensic, Distributed Systems.

2018-2019 **Graduate and Master Course:** Computer Networks, Object-oriented Programming language(c++), Artificial Intelligence, Game Programming, Ethical Hacking, Embedded Systems, Information Security Management, Virtualization.

Employment History (continued)

2016-2018 — **Graduate and Master Course:** Discrete mathematics, Python-I, Python-II, Software Engineering, Data Warehousing, Cryptography and network security, and Mobile computing.

Roles and Responsibility

2024- till date — **Research Professor at Sejong University**. Involved in drafting patents and projects. Participation at international forums and conferences. Training Ph.D. students and publishing research papers. And conducting lectures, seminars, and talks.

2023- 2024 — **Postdoc at Sejong University**. Involved in drafting patents and projects. Participation at international forums and conferences. Training Ph.D. students and publishing research papers.

2020- 2023 — **Research Associate at Sejong University**. Involved in drafting patents and publishing papers in international journals and conferences.

2017-2020 — **K J Somaiya as Assistant Professor**. Conducting lectures and practicals. Setting question papers and being involved in the evaluation process of the student academic. Actively involved in admission duties and other administrative duties. Representing the college at international forums and conferences. Involved in syllabus designing and creation of the research ecosystem. Collaboration with Maitri and other industry partners.

Research Interests

- **Unmanned Aerial Vehicles**, Sensor Fusion, Object tracking and segmentation, LiDAR and Robotics.
- **Autonomous driving vehicle,** Three-dimensional object detection in the point cloud, Panoramic view of multiple cameras.
- **Video Synopsis**, Detection and extraction of abnormal objects in time and domain space, Stitching of foreground to background.

Research Projects

Research Professor 2024 – till date

DisasterSLAM: A Collaborative Intelligence SLAM Framework for Multi-Hazard Detection with Deep Sensor Fusion and Semantic Understanding for Human-Centered Safety Navigation

The goal of DisasterSLAM is to develop a collaborative SLAM framework that integrates deep sensor fusion and semantic understanding to detect multiple hazards in real time. It aims to enable safe, human-centered navigation in disaster environments through intelligent environmental awarenessT.

Technology: Python, Deep learning frameworks, SLAM and library, Qt and Robot operating system, LiDAR, Drones, Depth Cameras, Raspberry Pi, Nano jetson, USB accelerator (Intel neural stick, Google coral).

Development of artificial intelligence based video security technology and systems for public infrastructure safety:

The objective is to develop a video synopsis framework for detecting abnormal objects.

Technology: Python, Deep learning frameworks and library, Qt and Robot operating system, LiDAR, Drones, Depth Cameras, Raspberry Pi, Nano jetson, USB accelerator (Intel neural stick, Google coral).

Postdoctoral 2023 – 2024

Development of artificial intelligence based video security technology and systems for public infrastructure safety:

The objective is to develop a video synopsis framework for detecting abnormal objects.

Technology: Python, Deep learning frameworks and library, Qt and Robot operating system, LiDAR, Drones, Depth Cameras, Raspberry Pi, Nano jetson, USB accelerator (Intel neural stick, Google coral).

TriConVNet: Video Synopsis Implementation for Panoramic Multiview Video Camera only for Detecting Abnormal Behavior of Human.

Objective:

The proposed TriConVNet-based synopsis framework. A TriConVNet is a multitasking learning model which stitches the images to create a panoramic view, segments the abnormal objects, and gives the depth of that objects. Later, these abnormal object tubes are stitched with the extracted background, creating a smooth abnormal behavior synopsis for multiple cameras.

Funded by: Institute of Information and Communications Technology Planning and Evaluation (IITP) grant funded by the Korea government (MSIT) (No.2019-0-00231)

Technology: Python, C++ Framework: TensorFlow and Keras, OpenCV, PyTorch Hardware: Surveillance cameras.

Research Projects (continued)

- **3DVSAv: 3D Video Synopsis in Autonomous Vehicle on Panoramic Camera View.**
  Objective:
  We proposed a 3D video synopsis of the autonomous vehicle framework (3DVSAv), in which we first created a panoramic view of multiple cameras. From the panoramic view, we detect, extract, and shift only the specific foreground objects to create a shorter 3D video for analysis.
  Funded by: Institute of Information and Communications Technology Planning and Evaluation (IITP) grant funded by the Korea government (MSIT) (No.2019-0-00231)
  Technology: Python, C++ and MATLAB, Framework: TensorFlow and Keras, OpenCV, Hardware: Autonomous vehicle with 8 attached cameras and LiDAR.

- **Abnormal Object Segmentation and Synopsis on Sensory Fused Data in Drone Surveillance.**
  Objective:
  We proposed a synopsis framework that extracts crucial information from the sensory data and creates a short video for analysis. The heart of this framework is the dual-task learning model, which segments and estimates the depth of the abnormal object that is shifted in the time and space domain to construct a synopsis.
  Funded by: Institute of Information and Communications Technology Planning and Evaluation (IITP) grant funded by the Korea government (MSIT) (No.2019-0-00231)
  Technology: Python, C++ Framework: TensorFlow and Keras, gazebo, Depth AI, OpenCV, ROS, Mavproxy Hardware: Depth AI Camera, gimbal camera, Velodyne Puck LITE, Tello, Parrot, DJI matrice.

- **Panoramic Video Synopsis on Constrained Devices for Security Surveillance.**
  Objective:
  We proposed a panoramic multiview video synopsis framework to tackle high computational cost, jitter, and collision artifacts, thus solving the issues of efficient analysis and storage. We embedded a synopsis framework on the end device to reduce storage, networking, and computational costs. A convolutional neural network was used to sew the multiple cameras' views to create a single panoramic view from which only the abnormal object tube is extracted and relocated in the time and space domain to create a condensed video.
  Funded by: Institute of Information and Communications Technology Planning and Evaluation (IITP) grant funded by the Korea government (MSIT) (No.2019-0-00231)
  Technology: Python, Framework: TensorFlow and Keras, OpenCV, Hardware: Raspberry Pi, Pi and USB cameras.

Research Projects (continued)

Structural inspection of the building in public infrastructure using the UAVs:
The objective is to develop a multitask learning method that learns the structure of the building and identifies the structural damage using the UAVs.
Technology: Python, Deep learning frameworks and library, Qt and Robot operating system, LiDAR, Drones, Depth Cameras, Raspberry Pi.

MT3DNet: Multi-Task learning Network for 3D Surgical Scene Reconstruction:
The objective is to develop a MTL model achieves 3D reconstruction through the integration of segmentation, depth estimation, and object detection, thereby enhancing the understanding of surgical scenes.
Technology: Python, Deep learning frameworks and library, Depth Cameras.

Uncalibrated 3D NeRF Construction for Enhanced Visual SLAM:
Development of a 3D Neural Radiance Field (NeRF) for images without calibration information, using joint optimization to address Structure from Motion (SfM) challenges. This improved framework is then applied to Visual Simultaneous Localization and Mapping (V-SLAM), enhancing its accuracy and efficiency in 3D environments.
Technology: Python, Deep learning frameworks and library, Qt and Robot operating system, LiDAR, Drones, Depth Cameras, Raspberry Pi, NeRF, V-SLAM.

Ph.D 2020 – 2023

Development of artificial intelligence based video security technology and systems for public infrastructure safety:
The objective is to develop a video synopsis framework for detecting abnormal objects.
Technology: Python, Deep learning frameworks and library, Qt and Robot operating system, LiDAR, Drones, Depth Cameras.

Integrated Interoperability Based Panoramic Video Synopsis Framework.
Objective:
Constructing the interoperability policy for integrating multiple types of cameras to build a panoramic video synopsis.
Funded by: Institute of Information and Communications Technology Planning and Evaluation (IITP) grant funded by the Korea government (MSIT) (No.2019-0-00231)
Technology: Python, Framework: TensorFlow and Keras, OpenCV, Hardware: IP-Cameras.

Research Projects (continued)

Multiview abnormal video synopsis in real-time.
Objective:
Construction of a multiview abnormal video synopsis framework that in real-time detects and extracts abnormal objects from multiple videos to create a smaller video for analysis.
Funded by: Institute of Information and Communications Technology Planning and Evaluation (IITP) grant funded by the Korea government (MSIT) (No.2019-0-00231)
Technology: Python, C++ and MATLAB, Framework: TensorFlow and Keras, OpenCV, Hardware: IP-Cameras.

Dvs: A drone video synopsis towards storing and analyzing drone surveillance data in smart cities.
Objective:
Synchronization of multiple drones on the fly to conduct aerial surveillance for detecting and tracking abnormal objects by fusing LiDAR and camera data. Sensory UAV setup design, acquisition of point cloud data using LiDAR mounted on UAV using an onboard computer.
Funded by: Institute of Information and Communications Technology Planning and Evaluation (IITP) grant funded by the Korea government (MSIT) (No.2019-0-00231)
Technology: Python, C++, Framework: TensorFlow and Keras, Pytorch, OpenCV, ROS, Hardware: Depth AI Camera, gimbal camera, Velodyne Puck LITE, Tello, Parrot, DJI matrice.

Real-time abnormal object detection for video surveillance in smart cities.
Objective:
Development of the object detection model which detects smaller abnormal objects and performs better than the state-of-the-art detection model.
Funded by: Institute of Information and Communications Technology Planning and Evaluation (IITP) grant funded by the Korea government (MSIT) (No.2019-0-00231)
Technology: Python, C++, Framework: TensorFlow and Keras, OpenCV.

2017 – 2020

Development of Hand Gesture Model for mute deaf and construction of a 3D printed prosthetic hand model.
The objective is to develop a sensory-based hand gesture model that sends an instruction to an application that will speak. Construction of a 3D-printed hand to depict the hand gesture based on an impulsive sensor.
Technology: Python, C++, Deep learning frameworks and library, MIT App Inventor, 3D printer, Flex sensor, Arduino Uno, Raspberry pi.

Research Projects (continued)

2014 – 2017 **Development of prototype: Unmanned Ground Counter-IED Vehicles (UGCV)**
The objective is to create a prototype that will autonomously detect and defuse the IED explosive, the UGCV can work autonomously and can be controlled remotely. The intelligent vehicle is equipped with detection and segmentation methods for the inference of harmful objects. A 360-degree movement robotic arm was constructed to suit the scenarios which was mounted on a driving vehicle.

Research Publications

Journal Articles Published

1. U. Ghani, A. Aslam, **P. Y. Ingle**, and R. H. Jhaveri, "Transparent and trustworthy blockchain-based scheme for the protection of vehicular soft integrity in shared mobility," *IEEE Transactions on Intelligent Transportation Systems*, 2025.
2. **P. Y. Ingle** and Y.-G. Kim, "Multi-sensor data fusion across dimensions: A novel approach to synopsis generation using sensory data," *Journal of Industrial Information Integration*, p. 100 876, 2025.
3. **P. Y. Ingle** and Y.-G. Kim, "Panoramic video synopsis on constrained devices for security surveillance," *Systems*, vol. 13, no. 2, p. 110, 2025.
4. A. J. Prakash, K. K. Patro, **P. Ingle**, J. J. Pujari, S. Routray, and R. H. Jhaveri, "Breastcancernet: Flask-enabled attention-driven hybrid dual dnn framework for real-time breast cancer prediction," *IEEE Journal of Biomedical and Health Informatics*, 2025.
5. **P. Y. Ingle** and Y.-G. Kim, "Multiview abnormal video synopsis in real-time," *Engineering Applications of Artificial Intelligence, SCIE, Impact Factor in JCR 2023: 8 JCR Ranking: 4.89%*, vol. 123, p. 106 406, 2023. URL: https://doi.org/10.1016/j.engappai.2023.106406.
6. **P. Y. Ingle** and Y.-G. Kim, "Video synopsis algorithms and framework: A survey and comparative evaluation," *Systems , SSCI, Impact Factor in JCR 2021: 2.895 JCR Ranking: 28.12%*, vol. 11, no. 2, p. 108, 2023. URL: https://doi.org/10.3390/systems11020108.
7. M. Parab, A. Bhanushali, **P. Ingle**, and B. Pavan Kumar, "Image enhancement and exposure correction using convolutional neural network," *SN Computer Science, Scopus, Impact Factor in JCR 2023: 3.78 JCR Ranking: 35%*, vol. 4, no. 2, p. 204, 2023. URL: https://doi.org/10.1007/s42979-022-01608-w.
8. **P. Y. Ingle** and Y.-G. Kim, "Real-time abnormal object detection for video surveillance in smart cities," *Sensors, SCIE, Impact Factor in JCR 2023: 3.576 JCR Ranking: 21.09%*, vol. 22, no. 10, p. 3862, 2022. URL: https://doi.org/10.3390/s22103862.
9. **P. Y. Ingle**, Y. Kim, and Y.-G. Kim, "Dvs: A drone video synopsis towards storing and analyzing drone surveillance data in smart cities," *Systems, SSCI, Impact Factor in JCR 2023: 2.895 JCR Ranking: 28.12%*, vol. 10, no. 5, p. 170, 2022. URL: https://doi.org/10.3390/systems10050170.

Journal Articles Under Review

1. **P. Y. Ingle** and Y.-G. Kim, "Three-dimensional panoramic video synopsis of autonomous vehicle," in Engineering Applications of Artificial Intelligence, SCIE, Impact Factor in JCR 2023: 8.
2. **P. Y. Ingle** and Y.-G. Kim, "Triconvnet: Video synopsis implementation for panoramic multiview video camera only for detecting abnormal behavior of human," in IEEE Transaction Pattern Analysis Machine Intelligence, SCIE, Impact Factor: 23.6.

Conference Accepted Paper

1. A. Bhanushali, P. Mithun, P. Kumar, and **P. Ingle**, *Adversarial Attack on 3D Fused Data in Drone Surveillance*. IEEE, International Conference on Advancement in Computation Computer Technologies Appear Online: May 2024. URL: https://ieeexplore.ieee.org/document/10551069.
2. **P. Y. Ingle** and Y.-G. Kim, *Integrated Interoperability Based Panoramic Video Synopsis Framework*. ACM SAC Conference 2024, Appear Online: April 2024. URL: https://dl.acm.org/doi/10.1145/3605098.3635937.
3. **P. Y. Ingle**, M. Parab, P. Lendave, A. Bhanushali, and P. K. BN, *A Comprehensive Study on LLM Agent Challenges*. AAAI spring symposium 2024, Appear online: April 2024. URL: https://aair-lab.github.io/aia2024/papers/ingle_aia24.pdf.
4. P. Mithun and **P. Ingle**, *Innovative Method for Camouflaged Wildlife Segmentation in Agricultural Practices*. IEEE, International Conference on Advancement in Computation Computer Technologies, Appear Online: May 2024. URL: https://ieeexplore.ieee.org/document/10551184.
5. T. Patel, R. Jhaveri, D. Thakker, S. Verma, and **P. Ingle**, *Enhancing Cybersecurity in Internet of Vehicles: A Machine Learning Approach with Explainable AI for Real-Time Threat Detection*. Proceedings of the 40th ACM/SIGAPP Symposium on Applied Computing, 2025, pp. 2024–2031.
6. **P. Ingle** and Y.-G. Kim, *Integrated Interoperability Based Panoramic Video Synopsis Framework*. Proceedings of the 39th ACM/SIGAPP Symposium on Applied Computing, 2024, pp. 584–591.

Patent

1. **P. Y. Ingle** and D.-H. Y.-G. Kim, "3d video synopsis generation method for abnormal object," in *Korea Institute of patent Information*, kipris, 2023.
2. **P. Y. Ingle** and Y.-G. Kim, "Method and system for generating video synopsis based on abnormal object detection," in *Korea Institute of patent Information*, kipris, 2021.

Seminars and Talks

- Influence of artificial intelligence technology in human society and why it is not a threat.
- Real and fake research and its long-term impact on the Economy.
- The inclusion of CNN in video surveillance and its corresponding applications.
- Threats of using the internet and measures to safeguard children.
- Every human has a pattern and how significant it is in designing an artificial brain.
- How autonomous vehicles and drone technology can drive a country's economy in the next decades.
- Who is watching you: The danger behind using mobile phones and the internet and how everyone is being flawed.
- How to accommodate artificial intelligence technology in designing smart cities.

Skills

Coding	Python (Preference), Java, C, C++, C#, Matlab, HTML, Swift, Quantum computing language (QCL), JavaScript.
High Level Library	TensorFlow, PyTorch, Depth AI, OpenCV, DroneKit, Gazebo.
Sensor and Devices	IoT - NodeMCU, Arduino Uno, Raspberry Pi, Nvidia Jestson, Drones, LiDAR, etc.

Miscellaneous Experience

Research Awards and Achievements

2025 **Outstanding Paper Award**, At The 23rd IEEE International Conference on Dependable, Autonomic and Secure Computing.

2023 **Outstanding Research Award**, During Ph.D. at Sejong University.

2022 **Best Paper Award**, By Korea Information Processing Society (KIPS).

Bronze Best Paper Award, IEEE Seoul Section.

Bronze Paper Award, Korea Information Processing Society (KIPS-AOH).

Technical Certification

2009 **MS- CIT**. Awarded by Anubhav computer Insitute.

2012 **Certification in Computer Hardware and Networking**.Awarded by IDEMI (Gov of India).

2013 **Certification in C language**. Awarded by C-DAC, GIST.

Certification in C, C++, HTML, Core JAVA programming. By IDEMI (Gov of India).

Certification in C.Net and ASP.Net. Awarded by IDEMI (Gov of India).

2014 **Certification in Advance Animation and Film Making**. Awarded by IDEMI (Gov of India).

2016 **Master in Python Programming**. Awarded by Mumbai University.

2019 **Certified Ethical Hacker** . Awarded by RST.

CCNA. Awarded by RST.

Additional Certification

2012 **'C' Certificate Holder**. Awarded by NCC (Gov. of India).

2011 **Civil Defence Course.** Gov. of India.

2018 **Qualified UGC NET for Assistant Professor** UGC, India.

Personal Information

- **Nationality**- Indian.
- **Date of Birth**- 19/02/1994
- **Languages** - English, Hindi, Marathi, Korean (level 1).