Pavan Kumar B N

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Education

2016 – 2020 **Ph.D - Virtual Environments Lab**, Chung-Ang University, South Korea.

2011 – 2013 **M.Tech - Computer Network and Engineering**, Siddaganga Institute of Technology, India.

2007 – 2011 **B.E - Computer Science and Engineering**, UBDT College of Engineering, India.

Employment Experience

2020 – till date **Postdoctoral Researcher** - Human-Computer Interaction Lab, Sejong University, South Korea.

2014 – 2016 **Assistant Professor** - Department of Computer Science, Bapuji Institute of Engineering and Technology, India.
Subjects Handled - 1. Software Engineering, 2. Programming in C with Data Structures.
2. Web Application Development.

2013 – 2013 **Software Engineer** - IdeaCarve Technologies Private Limited, India.
Responsibilities - 1. Infrastructure set-up and maintenance using Amazon Web Services. 2. Web application migration from local Infrastructure to Amazon Cloud and Scaling up the application performance and monitoring.

2012 – 2013 **Project Trainee** - LG Soft, India.
Responsibilities - 1. vCard generation API framework, 2. Peer to Peer Communication framework.

Research Interests

Unmanned Aerial Vehicles, **Human-Robot Interaction**, **Sensor Fusion**, **Human-Computer Interaction**, **Robotics**, **Eye Tracking**, and **Virtual Reality**.

Research Publications

An efficient key distribution approach for SCADA systems. Pramod T C, **Pavan Kumar B N** and N R Sunitha - **IEEE ICRDPET 2013**.

Media art with sensible interface. DuBeom Kim, **Pavan Kumar B N** and YoungHo Chai - **TechArt: Journal of Arts and Imaging Science 2017 - KCI Indexed**.

Image based trajectory planning for the complete LiDAR scanning in retrofitting process. **Pavan Kumar B N**, Adithya B and Young Ho Chai - **IPIU 2018**.

An experimental study on relationship between foveal range and FoV of a human eye using eye tracking devices. Adithya B, **Pavan Kumar B N**, Hanna Lee, Ji Yeon Kim, Jae Cheol Moon and Young Ho Chai - **IEEE ICEIC 2018**.

Research Publications (continued)

- **Calibration techniques and gaze accuracy estimation in pupil labs eye trackers.** Adithya B, Hanna Lee, **Pavan Kumar B N** and Youngho Chai - **TechArt: Journal of Arts and Imaging Science 2018 - KCI Indexed.**
- **Gaze-controlled virtual retrofitting of UAV-scanned point cloud data. Pavan Kumar B N**, Adithya B, Chethana B, Patil Ashok Kumar and Young Ho Chai - **Symmetry 2018 - SCIE Indexed.**
- **An efficient method for point cloud data visualization in retrofitting application.** Chethana B, **Pavan Kumar B N**, Ashok Kumar Patil, Adithya B and Young Ho Chai - **Korea Software Congress 2018.**
- **Inspired by human eye: vestibular ocular reflex based gimbal camera movement to minimize viewpoint changes.** Adithya B, **Pavan Kumar B N**, Young Ho Chai and Ashok Kumar Patil - **Symmetry 2019 - SCIE Indexed.**
- **Retrofitting with gesture interaction and all-in-one visualization in virtual environment.** Chethana B, **Pavan Kumar B N**, Ashok Kumar Patil, Adithya B and Young Ho Chai - **TechArt: Journal of Arts and Imaging Science 2019 - KCI Indexed.**
- **Interactive virtual retrofitting of 3D chiller models to optimize energy consumption: A 4-in-1 alignment use case.** Adithya B, Chethana B, Ashok Kumar Patil, **Pavan Kumar B N** and Young Ho Chai - **TechArt: Journal of Arts and Imaging Science 2019 - KCI Indexed.**
- **On-Site 4-in-1 Alignment: Visualization and interactive CAD model retrofitting using UAV, LiDAR's point cloud data, and video. Pavan Kumar B N**, Ashok Kumar Patil, Chethana B and Young Ho Chai - **Sensors 2019 - SCIE Indexed.**
- **GazeCamera: A novel gaze-controlled UAV camera. Pavan Kumar B N**, Adithya B, Ashok Kumar Patil, Chethana B and Young Ho Chai - **ACM ICCRT 2019.**
- **GazeGuide: Eye-gaze-guided active immersive UAV camera. Pavan Kumar B N**, Adithya B, Ashok Kumar Patil, Chethana B and Young Ho Chai - **Applied Sciences 2020 - SCIE Indexed.**

Projects

Ph.D.

- **Graphical user interface based navigation planing for unmanned aerial vehicle.**
  The objective is to develop a GUI based framework to a plan trajectory for autonomous UAV navigation.
  Programming Language: Python, Framework: Qt and Robot operating system, Hardware: AR Parrot 2.0 Drone.
- **On-site 4-in-1 alignment: visualization and interactive CAD model retrofitting using UAV, LiDAR's point cloud data, and video.**
  The objective is to provide a framework for interactive 3D CAD model retrofitting on a combination of UAV sensory setup-acquired point cloud data and real-time video from the camera in heavy industrial facilities.
  Programming Language: C and C++ Framework: Visualization Toolkit, PCL, Robot Operating System, OpenCV Hardware used: DJI Matrice 100, Velodyne PUCK Lite, DJI Manifold (onboard computer) and DJI Zenmuse X3 gimbal camera.
- **Gaze-controlled retrofitting of UAV-scanned point cloud data in a virtual environment.**
  Objective:
  1. Sensory UAV setup design.
  2. Acquisition of point cloud data using LiDAR mounted on UAV using onboard computer.
  3. Interactive retrofitting with acquired point cloud data and CAD Models in Virtual Environment by Human Eye Gaze.
  Programming Language: C++ and Python, Framework: Visualization Toolkit Hardware: Velodyne Puck LITE, HTC Vive with Pupil Labs eye Tracker, and DJI Matrice 100.

Projects (continued)

- **A point cloud data visualization in a virtual environment.**
  The objective is to visualize point cloud data in a Virtual Environment to analyze the site for retrofitting.
  Programming Language: C++, Framework: Visualization Toolkit, OpenVR, Hardware: HTC Vive.
- **Eye-gaze-guided active immersive UAV camera (Ongoing).**
  The objective is to control a UAV camera maneuvering through eye-gaze as an alternative and sole input modality. Thus, spatial awareness is directly fed without being mediated through remote control in surveillance and monitoring applications.
  Programming Language: C++ and Python, Framework: DJI SDK, OpenCV and ROS, Hardware: DJI Matrice 100, DJI Manifold, HTC Vive HMD with Pupil Labs eye tracker and Zenmuse X3 gimbal camera.

Seminars and Talks

- Introduction to CAPTACHA (Completely Automated Public Turing test to tell Computers and Humans Apart) and usage.
- Distributed Load Balancing in a homogeneous network using Fuzzy Logic.

Skills

Programming Languages	C/C++, Python, Java, HTML, JavaScript.
Tools/Library/Software	Robot Operating System, Visualization Toolkit, Point Cloud Library, Cmake, Qt and OpenCV.
Cloud Engineering	Amazon Web Services such as EC2, S3, RDS and CloudFront.

Activities and Awards

- An active open-source contributor for Visualization Toolkit.
- Secured second rank in Master's Degree.
- Awarded with Rajya Puraskar and Rashtrapathi Puraskar in Scout's and Guides.

Personal Information

- **Nationality** - Indian.
- **Languages Known** - Kannada, Hindi, English, and Basic Korean.