

Chethan M. Parameshwara

✉ cmparam9@terpmail.umd.edu • in cmparam • analogicalnexus
College Park, Maryland, USA

Education

- **University of Maryland, College Park**
Doctor of Philosophy, Neuroscience and Cognitive Science Aug 2017 – May 2022 (Expected)
Specialization: Bio-inspired Computer Vision and Learning for Robotics
Advisors: Prof. Yiannis Aloimonos and Dr. Cornelia Fermüller
- **University of Maryland, College Park**
Master of Engineering, Robotics, Aug 2015 – May 2017
- **Visvesvaraya Technological University, India**
Bachelor of Engineering, Electronics & Communication, Sep 2010 – Jun 2014

Research Interests

Computer Vision, Robotics and Machine Learning, involving object detection and tracking, 3D perception (visual odometry, optical flow estimation, SLAM, SfM) and self-supervised deep learning

Skills

- **Programming Languages:** Python, C++, MATLAB
- **Software Frameworks:** Deep Learning (PyTorch, TensorFlow, Caffe), Robotics (ROS), Vision (OpenCV, PCL, Kornia), Simulators (Blender, Unity)
- Hands-on experience with Event cameras (Samsung, Prophesee, iniLabs), Intel Quadcopter, Rethink Baxter Robot

Papers Under Review or Preparation

- **SpikeMS: Deep Spiking Neural Network for Motion Segmentation**
Parameshwara, C. M.*, Li, S.*, Sanket, N. J., Evanusa, M. S., Fermüller, C., & Aloimonos, Y. [under review in *IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS)*, 2021](* equal contribution)
- **EVPropNet: Detecting Drones By Finding Propellers For Mid-Air Landing And Following**
Sanket, N. J., Singh, C. D., Parameshwara, C. M., Fermüller, C., de Croon, G.C.H.E., & Aloimonos, Y. [under review in *Robotics: Science and Systems (RSS)*, 2021]
- **NudgeSeg: Zero-Shot Object Segmentation by Repeated Physical Interaction**
Singh, C. D.*, Sanket, N. J.*, Parameshwara, C. M., Fermüller, C., & Aloimonos, Y. [under review in *IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS)*, 2021](* equal contribution)
- **EgoMotionNet: Self-Supervised Learning of Ego-Motion using Spatio-Temporal Gradients**
Parameshwara, C. M., Fermüller, C., & Aloimonos, Y. [manuscript in preparation]

Publications

- **0-MMS: Zero-Shot Multi-Motion Segmentation With A Monocular Event Camera**
Parameshwara, C. M., Sanket, N. J., Singh, C. D., Fermüller, C., & Aloimonos, Y. *IEEE International Conference on Robotics and Automation (ICRA)*, 2021 | [video](#) | [paper](#) | [code](#) |
- **EVDodgeNet: Deep Dynamic Obstacle Dodging with Event Cameras**
Parameshwara, C. M.*, Sanket, N. J.*, Singh, C. D., Kuruttukulam, A., Fermüller, C., Scaramuzza, D., & Aloimonos, Y. *IEEE International Conference on Robotics and Automation (ICRA)*, 2020 (* equal contribution) | [video](#) | [paper](#) | [code](#) |
- **Event-based Moving Object Detection and Tracking**
Mitrokhin, A., Fermüller, C., Parameshwara, C. M., & Aloimonos, Y. *IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS)*, 2018 | [video](#) | [paper](#) | [code](#) |
- **Automated Mouse Behavior Recognition using VGG Features and LSTM Networks**
Kramida, G., Aloimonos, Y., Parameshwara, C. M., Fermüller, C., Francis, N. A., & Kanold, P. In *Visual Observation and Analysis of Vertebrate And Insect Behavior Workshop (VAIB)*, 2016 | [paper](#) |

Professional Experience

- **Graduate Research Assistant**, Perception & Robotics Group, University of Maryland *Aug 2017 – Present*
 - Developing optimization and deep learning algorithms for event-based cameras to solve motion perception tasks (moving object detection, ego-motion estimation, optical flow estimation, SLAM, SfM)
- **Graduate Teaching Assistant**, Department of Computer Science, University of Maryland *Aug 2018 – Present*
Responsibilities: guest lectures, office hours, grading, conducting discussion sessions
 - CMSC733 (Geometric Computer Vision), CMSC426 (Computer Vision)
- **Research Intern**, Neurala Inc., Boston *Jun 2019 – Aug 2019*
 - Implemented custom deep learning layers for Lifelong Deep Neural Networks (L-DNN) and Few-Shot Learning in the context of object detection and recognition tasks
- **Software Engineering Intern**, Robot Training Academy Inc.(RTA), College Park *Sep 2016 – Dec 2016*
 - Developed hand gesture tracking software for Human-Robot interaction in household environments
- **Software Engineer**, Bosch, India *Aug 2014 – Aug 2015*
 - Developed and integrated vehicle software (AUTOSAR) modules into Bosch Engine Control Unit (ECU) and tested the functionalities in Hardware-in-the-loop testing bench
- **Research Intern**, Indian Institute of Science, India *Jul 2013 – Aug 2013*
 - Analyzed mathematical models for finding information channel capacity in energy harvesting source

Presentations

- **Insights into the Early Motion Pathway**
Parameshwara, C. M.*, Burner, L. S.*, & Fermüller, C. , *Telluride Neuromorphic Cognition Engineering Workshop, Telluride, CO, 2020* (* equal contribution)
- **Motion Segmentation with Event Cameras**
Parameshwara, C. M. & Fermüller, C., *Telluride Neuromorphic Cognition Engineering Workshop, Telluride, CO, 2018*
- **Portable Assisted Mobility Device Challenge**
Parameshwara, C. M., Murthy, V. S., Narasimha L., Srinivasa A. D., & Vajram R., *PACE Global Annual Forum, Turin, Italy, 2014*

Awards

- **Graduate School Summer Research Fellowship**, University of Maryland, College Park *May 2020*
- **Ministry of Human Resources Development Scholarship**, Government of India, India *Aug 2010 – May 2014*
- **Summer Research Fellowship**, Indian Science Academies, India *Aug 2013*
- **Collaborative Innovation Challenge Finalist (1 of 3)**, PACE Global Annual Forum, Pasadena, CA *Jul 2013*

Volunteering Experience

- **Reviewer** *Jan 2020 – Present*
 - IEEE Robotics and Automation Letters (RA-L)
 - International Conference on Robotics and Automation (ICRA)
- **Research Mentor** *Aug 2017 – Present*
 - Mentored three undergraduate and two graduate students in designing computer vision research projects and teaching methodologies at Perception & Robotics Group, University of Maryland
- **Representative**, Graduate Student Government, University of Maryland *Aug 2020 – Present*
 - Representative of Neuroscience and Cognitive Science (NACS) in Graduate Student Government(GSG) and also a member of GSG Budget & Finance Committee
- **Workshop Staff**, Telluride Neuromorphic Cognition Engineering Workshop *Jun 2018 – Jul 2018*
 - Volunteered in 3-weeks hands-on workshop on neuromorphic engineering with neuroscience and engineering researchers at Telluride, CO