Kaustab Pal

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Technical skills

- **Programming Languages:** Python, C++, LaTeX
- **Technologies:** Eigen, Numpy, Cvxopt, SciPy, PyTorch, Jekyll, UNIX, Git, Vim.
- **Hardware:** Raspberry-Pi

Publications

1. **Kaustab Pal**, Sakyajit Bhattacharya, Sounak Dey and Arijit Mukherjee, "Modelling HTM Learning and Prediction for Robotic Path-Learning", in 7th IEEE RAS/EMBS International Conference on Bio-medical Robotics and Biomechatronics (BIOROB), August, 2018. [PDF]
2. **Kaustab Pal**, Rupayan Das, Rahul Sourav Singh and Dipta Mukherjee,"A Steganographic Approach to Data Obfuscation using Random Keyboard Mapping Technique", in International Journal of Computer Applications (IJCA), November, 2014. [PDF]

Patents

1. Dey, Sounak. Bhattacharya, Sakyajit. **Pal, Kaustab**. Mukherjee, Arijit. 2018. "Systems and Methods for Modelling Prediction Errors in Pathlearning of an Autonomous Learning Agent." India, filed August, 2018. Patent Pending

Projects

1. **Jekyll Zettelkasten:** Implemented the zettelkasten system of notetaking using the static site generator Jekyll and vim. [Github]
2. **MPC-CARLA:** Collected lane detection dataset in Carla and trained the "Lane shape prediction Transformer" deep neural network to detect lane boundaries. The lane boundaries are then used as a constraint in a MPC for generating trajectories for the autonomous vehicle to drive around in a CARLA map.
3. Formulated and implemented a model predictive controller for autonomous vehicles in a highway driving scenario. This project was in collaboration with the Centre for Artificial Intelligence and Robotics. [Github]
4. **DQN Experimentation:** Coded a DQN from scratch in the cartpole environment of OpenAi Gym using Tensorflow and then did a thorough analysis of how the performance of the DQN changes on varying various parameters. [Github] [Report]
5. Implemented the Responsibility-Sensitive Safety framework for safe navigation of autonomous vehicles in an unstructured parking lot scenario. This project was in collaboration with Intel.
6. **GESPI:** A Raspberry-Pi based hand gesture controlled robot built using the OpenCv library and Python. The hand gesture of a user is detected by a laptop's webcam and the appropriate command for that gesture is sent to the robot to make it move.

Experience

- **Skateboarding Club, IIITH** — **Hyderabad, Telengana, India**
  Founder and president — *03/2022 – present*
- **International Institute of Information Technology, Hyderabad** — **Hyderabad, Telengana, India**
  Research Assistant in Robotics Research Center — *05/2019 – present*
- **Tata Consultancy Services Research & Innovation Labs** — **Kolkata, West Bengal, India**
  Developer — *10/2016 – 04/2018*

Education

- **International Institute of Information Technology, Hyderabad** — **Hyderabad, Telengana, India**
  Robotics Research Center, M.S. by Research in Computer Science — *08/2020 – present*
- **University of Engineering & Management, Jaipur** — **Jaipur, Rajasthan, India**
  B.Tech in Electronics & Communications Engineering — *04/2012 – 06/2016*

Service and professional activities

- **Skateboarding tutorials:** As the founder and the president of the skateboarding club, I along with my team have conducted regular skateboarding tutorials in IIITH since the inception of the club in 2022.
- **RRC summer school, 2020 :** Gave lectures on motion planning and reinforcement learning in the RRC summer school of 2020.
- **Coordinator, Speaker:** Organized and coordinated a workshop cum short term course on "Scientific Computing Using Matlab" consisting of 100 students teaching them about the basics of digital image processing and steganography. (2013)