Shivani Kamtikar

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EDUCATION

University of Illinois at Urbana-Champaign (UIUC) — **Illinois, United States**
Master of Science in Computer Science — *Sept 2020 - May 2022*
- Courses: Learning Based Robotics | Computer Vision | Cognitive Science | Machine Learning | Data Mining | UI Design — GPA: 3.5/4.00

Savitribai Phule Pune University, Pune, India — **Pune, India**
Bachelor of Technology — *Aug 2016 - Aug 2020*
- Courses: Machine Learning | Artificial Intelligence | Database Management | NLP — GPA: 3.7/4.00

PUBLICATIONS

- *"Visual Servoing for Pose Control of Soft Continuum Arm in a Structured Environment (Shivani Kamtikar et al.)"* - under review at RA-L + RoboSoft, 2022.
- *"Towards Autonomous Berry Harvesting using Visual Servoing of Soft ContinuumArm for Pose Control (Shivani Kamtikar et al.)"* - under review at AI for Agriculture and Food Systems (AIAFS) 2022.

RELEVANT EXPERIENCE

University of Illinois at Urbana-Champaign — **Illinois, United States**
Graduate Research Assistant (Distributed Autonomous Systems Lab) — *Jan 2021 - Present*
- Demonstrated reliability of CNN based visual servoing in reach-control of soft continuum arms (SCA).
- Proposed and implemented 2 methods to perform smooth and robust 3D positioning tasks on SCA.
- Reduced error by 30% between the desired and current image by implementing a proportional control law.
- Demonstrated robustness of system with new targets, lighting change, loads, and diminution of SCA.
- Demonstrated ability to control position as well as orientation of SCA, unlike other methods.
- Achieved less than 2 cm translation error and less than 0.5 radians rotation error (best in market for SCA).
- Exhibited quick adaptability of the self-supervised system in a new environment in 3-4 hours.

University of Illinois at Urbana-Champaign — **Illinois, United States**
Graduate Teaching Assistant — *Sept 2020 - Dec 2020*
- Teaching assistant for the course 'Introduction to Deep Learning'.

University of Notre Dame — **Indiana, United States**
Research Intern — *June 2019 - July 2019*
- Received a full scholarship from iSURE - International Student Undergraduate Research Experience.
- Worked on a project titled "Statistical Social Network Analysis for Behavioral Research".
- Developed a network model that maps behavioral traits to mathematical equations to analyze personality.
- Improved the performance of the existing model by 28%.
- First student to be selected from my college and the only Indian selected to join the team.
- Featured on the website of the University of Notre Dame.

Dravin Solutions Pvt. Ltd. — **Pune, india**
Intern — *Oct 2017 - Dec 2017*
- Collaborated with analysts from stock market and gathered information about Futures and Options
- Built a custom training dataset and used regression analysis to predict next hour behaviour of the market.
- Successfully built a tool that provides buy and sell signals in real-time market.

ACADEMIC PROJECTS

Reinforcement Learning for Visual Servoing in a Structured Environment *September 2021 - Present*

- Trained a DDPG for tracking the path of the end effector of SCA to target using real-world data.
- Performed various ablation studies to find the best parameters for the DDPG.
- Demonstrated the shortcomings of DDPG on the system using experiments.
- Compared the system with other learning-based pose-estimation methods and proved their superiority.

Learning Based Relative Pose Estimation for Visual Servoing of a Soft Robot *March 2021 - May 2021*

- Implemented and trained 4 different CNN based architectures to learn relative pose between 2 images.
- Performed ablation studies to find the best parameters for each of the architectures.
- Demonstrated the performance of different architectures on SCA to reach a target from a given position.
- Compared the performance on the SCA prototype and demonstrated the best performing architecture.

Segmentation of Gliomas from Brain MRI *Nov 2020 - Dec 2020*

- Fine-tuned a Unet deep learning model for 3-D image segmentation of tumor in brain
- Achieved an accuracy of 78% which ranked 5th in the class.

Indian Sign Language Recognition using Deep Learning Frameworks *Jan 2019 - Aug 2020*

- Patent filed with the Indian Patent Office and received a grant of 1100 USD from IBM.
- Created a novel dataset by collecting images of Indian Sign Language (ISL) alphabets.
- Built a custom CNN based model from scratch to identify and classify ISL.
- Proved the robustness of the model on images in various lighting conditions, orientations, etc.
- Achieved an optimal accuracy of 97.3% on the gesture recognition task using a CNN trained from scratch.

LEADERSHIP EXPERIENCE

- Appointed the Diversity Advocate for a hiring committee at UIUC. - *2021*
- Volunteered as a committee member at the We21 conference hosted by SWE. - *2021*
- Treasurer of GradSWE (Graduate Society of Women Engineers) at UIUC. - *2021 - 2022*
- Gave a talk on Visual Servoing for Soft Arms at the Illinois Autonomous Farms (IAF) Workshop, UIUC - *2021*

RELEVANT SKILLS

Skills: TensorFlow | PyTorch | Python

INTERESTS

Interests: Reading | Painting | Travelling | Blogging