Kiran Kumar Lekkala

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Education

Viterbi School of Engineering, USC — **Los Angeles, USA**
PhD. Candidate, Computer Science — *August 2018 – December 2024*
Advisor: Prof. Laurent Itti
Thesis: *Transferable Pretrained models for Visual Navigation*

Indian Institute of Information Technology — **SriCity, India**
BTech (Hons.), Computer Science and Engineering — *August 2013 – May 2017*
Thesis: *Enhancing Visual SLAM systems for Autonomous Quadcopters*

Interests

Artificial Intelligence/Machine Learning: Reinforcement Learning, Lifelong Learning, Continual Learning, Meta Learning, Multi-task Learning, Self-Supervised Representation Learning, Contrastive Learning, Transformers, GPT, LLMs, VLMs, Autoregressive Models
Robotics: Autonomous Vehicles, Autonomous Driving, Mobile Robots, Visual Navigation, Visual SLAM, State Estimation and Sensor Fusion
3D Computer Vision: Simulators, Graphics, Gaussian Splatting, Text-to-3D Diffusion, 3D-LLMs, Neural Radiance Fields, 3D Reconstruction
ML Systems: Distributed Systems, Distributed RL, Model/Data Parallelism, Edge Computing

Awards and Achievements

USC Annenberg Fellowship: Four-year graduate fellowship awarded to 10% of incoming PhD. students.
USC Graduate school Travel Award: Travel award for exceptional PhD students.
Dean's Award for Research contribution: Award for outstanding Undergraduate research.
Dean's List of Academic Excellence: Award for achieving academic distinction for 4 semesters
ACM-ICPC: Honorable Mention in ACM-ICPC 2014 Asia Region.

Selected Publications

Real-world Visual Navigation in a Simulator using Scene Generation: *Kiran Lekkala, Henghui Bao, Laurent Itti*
Under preperation. *Presented* at the 2023 Annenberg Research Symposium. *Awarded cash prize.* [Webpage]
USCILab3D Dataset: A Large-scale, Long-term Outdoor 3D Dataset: *Kiran Lekkala, Henghui Bao, Laurent Itti*
Under preparation. [Webpage]
Value Explicit Pretraining for Goal-Based Transfer Learning: *Kiran Lekkala, Henghui Bao, Sumedh Sontakke, Laurent Itti*
In submission to ICML 2024. *Spotlight presentation* at CoRL 2023 Workshop on PRL. [Link].
Evaluating Pretrained models for Deployable Lifelong Learning: *Kiran Lekkala**, *Eshan Bharghava**, *Yunhao Ge, Laurent Itti*
In submission to CoLLA 2024. Also *accepted* at WACV 2024 Workshop on Pretraining. [Link].
World model-based Sim2Real Transfer for Visual Navigation: *Chen Liu**, *Kiran Lekkala**, *Laurent Itti*

Under Review at ICRA 2024. Also *accepted* at NeurIPS 2023 Robot Learning Workshop [Link].

Shaped Policy search for Evolutionary strategies using waypoints: *Kiran Lekkala, Laurent Itti*
Published in ICRA 2021 [Link].

Attentive Feature Reuse for Multi Task Meta learning: *Kiran Lekkala, Laurent Itti*
Presented at EML Workshop at ICLR 2021 [Link].

Simultaneous Aerial Vehicle Localization and Human Tracking: *Kiran Lekkala, VK Mittal*
Published in TENCON 2016 [Link].

Accurate and Augmented Navigation for Quadrocopter based on Multi-Sensor Fusion: *Kiran Lekkala, VK Mittal*
Published in INDICON 2016 [Link].

Co-Authored

Lightweight Learner for Shared Knowledge Lifelong Learning:
Published in Transactions on Machine Learning Research. [Link][Press Coverage].

Ferroelectric FET based Context-Switching FPGA Enabling Dynamic Reconfiguration for Adaptive Deep Learning Machines:
Published at Science Advances. [Link].

USC-DCT: A Collection of Diverse Classification Tasks:
Published in MDPI [Link].

PrePrints

Low Cost Autonomous Mapping system for 3D-LLM based Scene Understanding: *Kiran Lekkala, Laurent Itti*

Paragraph Segmentation from Transcripts using LLM based Semantic Grounding: *Kiran Lekkala*

Meta adaptation using Importance weighted Demonstrations: *Kiran Lekkala, Laurent Itti* [Arxiv].

Professional Experience

ILab, USC — **Los Angeles, CA**
Graduate Research Assistant — *August 2018 – December 2024*
Worked on projects funded by C-BRIC and DARPA, along with working on my PhD Research.

Computer Graphics and Immersive Technologies, USC — **Los Angeles, CA**
Student Researcher — *December 2017 – April 2018*
Implemented a novel Contour Approximation algorithm using recursive Convex hull estimation.

Google Summer of Code — **Remote**
Student Developer — *May 2016 – August 2016*
Created easy-to-use APIs and firmware for Beaglebone Blue in collaboration with Beagleboard.org and UC San Diego.

International Institute of Information Technology — **Hyderabad, India**
Undergraduate Researcher — *August 2013 – May 2014*
Developed a full-stack system for a Quadcopter comprising of EKF based pose-tracker, Scene-flow, Depth-based LSD-SLAM and Obstacle avoidance for my Undergraduate Hons. Thesis.

Reviewer

ICANN, ICRA, IROS

Technical Skills

ML Frameworks/Environments: Pytorch, JAX, Hugging Face, Accelerate, DeepSpeed, Ray, RLlib, MPI, Tensorflow, Keras, TFLite, Caffe, MXNet, Scikit, NLTK

Programming Languages: C, C++, C#, Python, UNIX Bash, Java, JavaScript, PHP, Ruby

Vision and Graphics: MATLAB, Simulink, OpenCV, Unreal Engine, WebGL, PCL, CUDA, OpenGL

Robotics: IsaacSim, IsaacGym, ROS, MRPT, ARM Boards, AutoCAD, Fusion360

Software Development: Git, SQL, MongoDB, HTML, CSS, AWS, Kubernetes, Docker