

SKANDA BHARADWAJ

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EDUCATION

Ph.D. in Computer Science & Engineering
THE PENNSYLVANIA STATE UNIVERSITY
Aug 2021 - May 2025 (Expected)

MS in Computer Science & Engineering
THE PENNSYLVANIA STATE UNIVERSITY
May 2021 | GPA: 3.96/4.0

BE in Telecommunications Engineering
PES INSTITUTE OF TECHNOLOGY
May 2015 | GPA: 9.39/10.0

SKILLS

Computer Vision	Deep Learning
Object Tracking	Kalman Filtering
Pytorch	OpenCV
Python	C++, MATLAB

GRADUATE PROJECTS

AUGMENTED REALITY

- Displayed artificial objects overlaid on images of a real 3D scene.
- COLMAP-based 3D reconstruction.
- Implemented RANSAC-based plane fitting.
- Implemented 3D-to-2D camera projection with Z-ordering.

OBJECT TRACKING WITH SIAMFC

- Considered the limitations of state-of-the-art SiamFC tracker – missing motion model and sensitivity towards drastic changes to the appearance model.
- Implemented Linear Kalman Filter to address the missing motion model.
- Implemented anchoring-based reference image update for robustness against changing appearance model.

LATTICE DETECTION USING RCNN

- Performed detection and localization of unit lattices in symmetric images without foreground-background distinction.
- Performed RCNN-based recognition.
- Key aspects - transfer learning, NMS and t-SNE analysis.

HONORS AND AWARDS

- Runners-up at **HackPSU** 2019.
- Winners of **Nittany AI** and **Google Cloud Challenge** at HackPSU 2019.
- **Best Project Award**, Intra-college Technical Fest, PESIT

RESEARCH

🌐 LPAC | RESEARCH ASSISTANT

Penn State, State College, PA

Aug 2021 – Present

- My research at the Laboratory for Perception, Action and Cognition (LPAC) involves exploration of visual perception via recurrence in single image leading towards scene understanding.
- We use recurrence in downstream applications such as vanishing point detection, instance-counting and detection of potential 3D translation symmetry, all from just a single view (under review in *ACCV* 2022).

🌐 UIT LAB | RESEARCH ASSISTANT

Penn State, State College, PA

Jan 2019 – May 2021

- Improved object tracking for arterial wall motion estimation using Siamese convolutional neural networks using linear and extended Kalman filtering.
- Improved on exhaustive search strategy, a commonly used search technique for similarity matching in ultrasound images, with adaptive rood pattern search and sub-pixel interpolation.

EXPERIENCE

PENN STATE | TEACHING ASSISTANT

State College, PA

Aug 2019 - Present

- Teaching Assistant for “*Fundamentals of Computer Vision*”
- Developed computer vision algorithms as a part of Autonomous Robotic Competitions Club.

CONTINENTAL | COMPUTER VISION ENGINEER

Bengaluru, India

July 2015 – Dec 2018

- Played a key role in the development of multi-object tracking using Extended Kalman Filter for Traffic Sign Recognition component for automotive cameras.
- Extended technical support to BMW, Toyota and Honda projects for tracker based issues.
- Developed mathematical models for road-marking sign recognition, uncertainty estimation and automation tools to evaluate tracker performance for accurate depth estimation.

SELECTED PUBLICATIONS

1. Shimian Zhang, **Skanda Bharadwaj**, Keaton Kraiger, Yashasvi Asthana, Hong Zhang, Robert Collins, and Yanxi Liu, “Novel 3D Scene Understanding Applications From Recurrence in a Single Image.” *arXiv preprint arXiv:2210.07991* (2022).
2. **Skanda Bharadwaj**, Sumukha Prasad, Mohamed Almekkawy, “An Upgraded Siamese Neural Network for Motion Tracking in Ultrasound Image Sequences”; *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, 68(12) : 3515–3527, 2021.
3. Hassan Alqahtani, **Skanda Bharadwaj**, and Asok Ray, “Classification of fatigue crack damage in polycrystalline alloy structures using convolutional neural networks”; *Engineering Failure Analysis* (2020) : 104908