# Keifer **Lee**

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## Education

### New York University

MS in Computer Engineering | CGPA: 3.815 *Aug. 2022 - May. 2024*

- Graduate Research Assistant with Professor Chen Feng at the AI4CE Lab.
- Teaching Assistant for the undergraduate Robot Vision and graduate Robotics Perception course.
- NYU merit scholarship awardee.

### Taylor's University

B.Eng. (Hons) in Electrical and Electronic Engineering | CGPA: 3.65 *Mar. 2015 - Aug. 2019*

- Undergraduate Research Assistant for a project on autonomous monocular target-tracking UAV.
- Taylor's Grand Challenges Scholarship awardee, 5 times Dean's List and 2 times Book Prize awardee.
- B.Eng Thesis: Development of Low Computational Power Vision Tracking Algorithm on Embedded System.

## Research Experience

### Robotics @ Bell Labs (Incoming)

Bell Labs *Jan. 2024 Expected*

### SO-NeRF: Active View Planning for NeRF using Surrogate Objectives (Under Review)

New York University *Nov. 2023*

- **Advisor**: Chen Feng @ AI4CE Lab | **Project page**: `https://ai4ce.github.io/SO-NeRF/`
- **Summary**: Optimal neural radiance fields for autonomous robotics via active perception with surrogate objectives derived from first principled geometric and photometric cues. Our method achieves better reconstruction quality and an average ~80x speed-up compared to the baseline.
- Designed and derived most of the proposed method, served as the lead engineer, and led a team of 4 other students as the first author.

### Sim2Real for 3D Pose Estimation and Instance Segmentation

New York University *May. 2023*

- **Advisor**: Chen Feng @ AI4CE Lab & private industry partners
- **Summary**: Sim2Real for robotic perception (pose estimation and segmentation) with an industry partner in the manufacturing sector.
- Led the work on tackling the problem with domain transfers via generative models, and self-supervising learning for better domain adaptation.
- Improved key metrics by ~2x on real-world data for our industry partner.

### BOBBY2: Buffer-Based Robust High-Speed Object Tracking

Taylor's University *Apr. 2020*

- **Advisor**: Swee King Phang @ Taylor's Unmanned Aerial Vehicle Research Group
- **Summary**: Real-time monocular tracking for autonomous UAV with SoC via a novel buffer-based Siamese CNN. No pilots required.
- Derived and developed the model from end-to-end. Work done in parts as an Undergraduate Research Assistant and ML Research Engineer.

## Professional Work

### IBM

Data Science Intern *May. 2023 - Aug 2023*

- Designed and developed a MLOps-compliant NLP starter-kit with IBM's Large Language Foundation Models serving hundreds of IBM-ers.
- Introduced methods to improve task accuracies by +20% and reduced the average model development time from 2 weeks to 1 day.
- Deployed models end-to-end via OpenShift & Kubeflow, whilst reducing deployment time by 90%.
- Created a Retrieval Augment Generation Q&A chatbot with IBM's Foundation Model and other cutting-edge models such as LLAMA-2.

### MoneyLion Inc

Data Scientist II *Sep. 2020 - Aug 2022*

- Worked on a core product with >$1 Billion served annually with a small tight-knit team.
- Spearheaded large-scale statistical experiments in production on hundreds of thousands of users in collaboration with teams across the functional spectrum, from backend engineering to frontend marketing and legal.
- Very comfortable with cross-team communication and defining structures in high-speed unstructured environments with open questions.
- E.g. Led end-to-end projects optimizing user acquisition model, improving performance by 2x while lowering credit risk at the same time, and improved system run-time by ~7x. Responsible for development, deployment, validation, product integration, and lifecycle maintenance.
- E.g. Co-led a seamless, large-scale production database migration for infrastructure enhancement without disruption for 300k users.
- Worked with MLOps to establish continuous model monitoring and automated retraining pipelines to ensure performance across time.
- Served as a mentor to new Data Scientists on all matters from Machine Learning modeling, to live statistical testing, to stakeholder management.

## Honors & Awards

2022 **NYU School of Engineering Scholarship**, New York University
2019 **Best High Impact Research Award**, 12th International Engineering Research Conference
2018 **Best High Impact Research Award**, 11th International Engineering Research Conference
2018 **Global Finalist & 1st Runner-Up**, NASA SpaceApp Challenge
2015 **Taylor's Grand Challenge Scholarship**, Taylor's University

## Projects

### Leave Your Clothes Behind (LYCB)

Course Project *May. 2023*

- Created a novel framework to extract virtual-wearable 3D garment models from monocular videos.
- Pipeline covered tasks such as semantic segmentation, structure from motion (SfM), novel view synthesis, and 3D reconstruction.
- Received full mark for the project in the course. Project can be found at `https://github.com/IamShubhamGupto/LYCB`.

### Arbitrage Bot

Personal Project *Aug. 2018 - Jun. 2019*

- Wrote a Python algorithm to arbitrage cryptocurrencies. Capable of performing multi-step arbitrages between a chain of trading pairs.
- Developed a paper-trading (simulation) application with live feed data from various exchanges for real-time validation.
- Capable of parsing 400+ trading pairs across multiple exchanges within 2 sec.
- As a side project, made +$10,000 return (>%100) on my investment via the bot.

## Leadership & Community

### 1stDayHack 2020

Founder & Lead Organiser *Sep. 2019 - Jan. 2021*

- Organised and led Malaysia's first Machine Learning Workshop+Hackathon for 60 secondary students from across Peninsular Malaysia.
- Created a beginner-friendly ML course, ran ML workshops, and oversaw the entire program.
- Wrote and produced a free multi-chapter video-based crash course, covering topics from introductory Python to Deep Learning. My embarrassing notes can be found at `https://tinyurl.com/1stdayhack`.
- Created 1stDayKit, a ML toolkit that consolidating 12 state-of-the-art models into one easy to use package. Written with Python and PyTorch.

### CampusHero

Committee Member *Oct. 2017 - Aug. 2019*

- Ran 20+ student community events in Malaysia with leading partners ranging from Google to Microsoft and Petronas.
- Impacted 300+ students in Peninsular Malaysia through expert-mentoring sessions, hackathons and Python workshops.

## Skills & Courses

**PROGRAMMING** Python · Matlab · Bash · Kubernetes · Docker · Slurm · AWS · SQL · Redshift · Snowflake · LaTeX
**MACHINE LEARNING** PyTorch · Tensorflow · 3D Vision · Reinforcement Learning · Generative AI · Time-Series Modelling
**COURSES** Deep Learning · Image & Video Processing · Probability & Stochastic Processes · Real-Time Embedded Systems
Control Systems · Signals & Systems · Computing Systems Architecture · Computational Statistics