

# Suro Lee

New York, NY | Canadian citizen | 929-575-1938 | [sl5203@columbia.edu](mailto:sl5203@columbia.edu)  
[suro119.github.io](https://suro119.github.io) | [linkedin.com/in/suro-lee](https://linkedin.com/in/suro-lee) | [github.com/suro119](https://github.com/suro119)

## EDUCATION

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### Columbia University

*Master of Science – Computer Science, Machine Learning Track*

- GPA: 4.08

Dec 2023 (expected)

*New York, US*

### Korea Advanced Institute of Science and Technology (KAIST)

*Bachelor of Science – Computer Science, Specialization in Artificial Intelligence*

*Minor in Electrical Engineering*

Dec 2021

*Daejeon, Korea*

## RELEVANT COURSEWORK

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**Math:** Real Analysis, Linear Algebra, Probability and Statistics, Differential Equations

**Machine Learning:** Computational Learning Theory, Statistical Learning Theory, Machine Learning, Artificial Intelligence, Computer Vision, AI Based Software Engineering, Natural Language Processing

## EXPERIENCE

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### Columbia University

*Teaching Assistant (Spring 2023, Fall 2022)*

Sep 2022 – May 2023

*New York, US*

- Competitive Programming: Supported 220+ undergraduate/graduate students prepare for ICPC contests by holding weekly office hours that cover solutions to challenging problems
- Computing for Business Research: Supported 70+ graduate students in Python, MATLAB, C, Bash, R, MySQL, TensorFlow, and Git by holding weekly office hours

### Samsung Research

*Software Engineer, Visual Perception Team*

Jan 2022 – Jul 2022

*Seoul, Korea*

AI Recipe Navigation

- Led the full-stack development of an interactive recipe navigation web demo with 2000+ lines of Python and JavaScript code using Node.js, Flask, Svelte, Bootstrap, and Mosquitto
- Deployed three state-of-the-art AI models from Samsung Research
- Action recognition and speech recognition models were used to query the main server, which would return the corresponding recipe step. Then, using a video localization model (Graph2Vid), these steps were mapped to a segment in a YouTube video, and the corresponding segment would automatically start playing on the web client.

AI Cooktop

- Developed an ingredient detection demo that uses a projector and a homography matrix to display detection results on a kitchen table and suggest appropriate recipes based on the ingredients

### KAIST INA Lab

*Undergraduate Researcher*

Feb 2021 – Sep 2021

*Daejeon, Korea*

Project: Content-Aware and Task-Aware Variable Rate Image Compression using Compressive Autoencoders

- Exploited content-specific redundancies by training a compressive autoencoder with a dataset consisting of only one type of content such as faces (i.e., CelebA Dataset), achieving up to 2% improvement in terms of PSNR
- Optimized the compressive autoencoder for a task-specific loss instead of a perceptual loss, which outperformed JPEG in image classification up to 11% in terms of accuracy for low resolution images

### Koh Young Technology

*Research Intern, Machine Intelligence Team*

Mar 2019 – Aug 2019

*Yongin, Korea*

- Implemented a prototype for a distributed, real-time SMT (surface-mount technology) inspection process using Apache Kafka, Apache Spark, and Apache HBase—which was later developed into a successful full-fledged product
- Achieved up to 10x speed up from batch processing, significantly decreasing the number of defects in the solder paste printing process

## SELECTED PROJECTS

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**Hybrid Adaptive Ant Colony System for TSP** | *Metaheuristic Optimization* Sep 2020 – Dec 2020

- Sped up convergence speeds by using randomized local search at initial stages of ant colony system (ACS)
- Dynamically tuned ACS parameters throughout algorithm to encourage exploration away from local optima
- Outperformed randomized two-opt algorithm, and removed need to set experiment-specific parameters in conventional ACS

**Masked Emotion Detection for COVID-19** | *Computer Vision* Sep 2020 – Nov 2020

- Led a team of four to improve emotion detection performance on masked faces by training deep learning model with synthetic masked data and existing masked datasets
- Extended Deep Emotion model, attaining improvements up to 16% on three emotion datasets

## EXTRACURRICULAR ACTIVITIES

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**2022 ICPC North American Qualifier** Feb 2023

- 4<sup>th</sup> out of 64 teams in Columbia University

**2022 ICPC Columbia University Local Contest** Sep 2022

- 15<sup>th</sup> out of 112 participants; solo contest

## TECHNICAL SKILLS

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**Languages:** Python, C++, C

**Machine Learning:** PyTorch, TensorFlow

**Web Development:** HTML, CSS, Svelte, Flask,  
Bootstrap, Node.js

**Mobile Development:** Android Studio, Flutter, Unity

**Distributed Systems:** Apache Kafka, Apache Spark,  
Apache HBase

**Developer Tools:** Docker, GitHub