
EDUCATION

Tokyo, Japan	Tokyo Institute of Technology	Apr 2021 – Apr 2024
<ul style="list-style-type: none">• Pursuing Ph.D. with graduate major in Systems and Control Engineering• Research (Computer Vision): Design efficient neural network architectures using techniques such as knowledge distillation, neural architecture search, and evolutionary algorithms for image classification and object detection of degraded images• Supervisors: Prof. Masayuki Tanaka and Prof. Masatoshi Okutomi		
PUBLICATIONS		
<ul style="list-style-type: none">• ILIAC: Efficient classification of degraded images using knowledge distillation with cutout data augmentation (submitted in a conference and currently under review)		
Normal, Illinois, USA	Illinois State University	Aug 2015 – May 2017
<ul style="list-style-type: none">• Master of Science in Information Systems, May 2017• Graduate Coursework: Research Methodologies; Machine Learning; Advanced Database Management		
Indore, India	RGPV	Aug 2010 – June 2014
<ul style="list-style-type: none">• Bachelor of Engineering in Computer Science, June 2014.• Undergraduate Coursework: Algorithms; Data Structures; Operating Systems; Cloud Computing; Networking		

PROFESSIONAL EXPERIENCE

Data Scientist (Tokyo, Japan)	Woven Planet Holdings	Nov 2021 – Present
<ul style="list-style-type: none">• Summary: Member of the self-driving perception team where I utilize various computer vision approaches to solve problem such as road marking detection, object detection, active learning for large-scale production systems that are directly used by Toyota self-driving vehicles		
Technologies: Python, PyTorch, Detectron2 (FAIR), MMDetection, AWS, Git, SCRUM, Docker		
PROJECTS		
Scene Tags Classification: Design and develop a production model for the classification of scenes for a wide variety of scenarios based on weather, road type, parking, road structures, traffic conditions, intersections, and so on with macro-f1: 0.65 and micro-f1:0.75 for around 100 classes		
Few-shot object detection: Design and develop a few-shot object detection method based on CenterNet architecture to improve the performance of the production model on long-tail distribution objects such as ambulances, bikes, and kickboards based on the images of fish-eye lens cameras		
Road Marking Recognition: Developed a production model trained on Japanese/English text images to predict paint on streets/roads for self-driving vehicles using the backbone of the CRNN text recognition model with 99% word accuracy and ~0.2 msec latency on a synthetic dataset		
ADDITIONAL ROLES		
<ul style="list-style-type: none">• Technical Interviewer: Part of the hiring team to screen candidates, review code challenges, and conduct technical interviews focusing on computer vision basics and algorithms/data structures coding		
Computer Vision Researcher (Tokyo, JP)	Rakuten (RIT)	Nov 2020 – Oct 2021
<ul style="list-style-type: none">• Summary: Utilize deep learning, traditional machine learning, and reinforcement learning to solve Rakuten's research problems. Lead machine learning engineers to deploy systems from proof-of-concept (PoC) to production and collaborate with other researchers to deliver diverse systems for various business units.		
Technologies: Python, TensorFlow, PyTorch, Keras, Time Series, Scikit-learn, Docker, Git, Bandit, Evolution		

PROJECTS

Lifelong Taxonomy Learning: Developed a hierarchical classification continual learning model for change in the genre of images over time by utilizing lifelong learning methods and CNNs while baselining the results on Open Images and Fashion MNIST

Azimuth Angle Measurement from Drone Images: Developed an object detection model to measure the Rakuten Mobile tower's antenna angle direction based on the captured aerial drone images using oriented object detection approach

Screw Inspection of Mobile Tower from Drone Videos: Developed a system that can identify screws properly tightened in the mobile towers from drone-captured videos using various computer vision approaches such as keyframe detection, object detection, hand-written optical character recognition, image classification, and line detection

PATENTS

- **Ensembles Optimization using Genetic Algorithms:** Invented a new approach to find the best-optimized combination of weak supervised models by using evolutionary search and tournament selection approach based on weighted metrics, granted on 2020/11/27 in JPO ([6801149](#))
- **Anomaly Detection in Cybersecurity:** Invented a new approach for anomaly detection based on the change in user probabilities using multi-modal learning (CNN & LSTM), granted on 2022/06/01 in EPO ([EP4006760A1](#))
- Filed 4 other patents on topics related to azimuth angle and screw inspection using drone images

ADDITIONAL ROLES

- **AI Trainer:** Delivered training on image classification & object detection using convolutional neural networks and fundamentals of ML in Rakuten for 200+ employees dispersed around different Asia-Pacific locations
- **Study Group Lead:** Founder and organizer of Reinforcement Learning study group and paper reading sessions

Research Scientist (Tokyo, JP)

Rakuten (RIT)

Apr 2018 – Oct 2020

PROJECTS

Recommendation System - Multi-Armed Bandits: Developed a personalized contextual bandit model for real-time low latency application based on state-of-the-art methods to optimize ad banners on Rakuten e-commerce websites for tens of millions of users with 2 times better CVR than the baseline

Anomaly Detection in Cybersecurity: Developed a user and entity analysis (UEBA) tool using k-means clustering and multimodal (CNN & LSTM) learning to detect anomalies in tens of thousands of employee's behaviors from network text logs with 70% positive rate as compared with 10% from third party tool

Credit Scoring: Increased the approval rate of credit card merchant customers by 5% by developing a credit scoring model and segmentation of merchants that led to an increase in revenue of millions of dollars

Market Trading: Gained more than 7% ROI / year in daily trading of products such as forex currency pairs, bonds, and indexes by developing end-to-end machine learning models (RNN & Traditional ML) based on historical market macroeconomics data for assets under management (AUM) of tens of millions of dollars

Data Scientist Intern (IL, USA)

RR Donnelley

Jan 2017 – Aug 2017

Technologies: Python, Scikit-learn, Tableau, Experimental Design, MS Excel, R, Feature Engineering

- Worked with marketing research team to target customers for various healthcare, insurance, and retail store clients by applying machine learning, experimental designs, segmentation and statistical modeling
- Trained different optimized supervised and unsupervised machine learning models based upon the problem to increase the responses of direct mail marketing campaigns for various clients

Research Assistant (IL, USA)

Illinois State University

Aug 2016 – May 2017

Technologies: Python, computer vision, OCR, Theano, Caffe, image transformation, optimization

- Helped the professor in reproducing state-of-the-art research papers in computer vision on MNIST & CIFAR-10 datasets, utilizing Theano & Caffe machine learning libraries on Nvidia Titan X GPUs