# YANGZHE KONG

1616 21st St N, Arlington, VA 22209 | 571 604 4684 | yangzhe@vt.edu
https://yanko96.github.io/ | https://github.com/Yanko96

## EDUCATION

**Doctor of Philosophy: Computer Science** *Spring 2024 – Current*
Virginia Tech *Falls Church, Virginia*

**Master of Science (w/ honors)**: **ICT Innov**. (**Visual Computing and Communication)** *Sept 2019 – Jun 2020*
Aalto University *Espoo, Finland*
Overall GPA: 4.32/5.0
**Core Courses** *Computer Vision, Machine Learning, Digital Signal Processing, Bayesian Data Analysis*

- Dean's Incentive Scholarship, 2019 & 2020

**Master of Science**: **Info & Comm Engineering** *Sept 2018 – Jun 2020*
University of Trento *Trento, Italy*
Overall GPA: 28.25/30
**Core Courses**: *Recognition Systems, Multimedia Data Security, Computer Graphics*

- Excellent Master Student Scholarship, 2019
- Start-up Lab Winner (patents awarded), 2019

**Bachelor of Engineering**: **Transportation Engineering** *Sept 2014 – Jun 2018*
Tongji University *Shanghai, China*
Overall GPA: 3.0/4.0
**Core Courses**: *Automatic Control Theory, Operations Research, Traffic Information Engg, Traffic Design.*

## PUBLICATIONS & PATENTS

[1] Tang, Q.*, **Kong, Y.*,** Pan, L., & Lee, C. (2022). Learning to Solve Soft-Constrained Vehicle Routing Problems with Lagrangian Relaxation. *arXiv preprint arXiv:2207.09860.* https://arxiv.org/abs/2207.09860, * equal contribution

[2] **Kong, Y.,** Petrov, D., Räisänen, V., & Ilin, A. (2021, May). Path-Link Graph Neural Network for IP Network Performance Prediction. In 2021 *IFIP/IEEE International Symposium on Integrated Network Management (IM)* (pp. 170-177). IEEE. https://ieeexplore.ieee.org/abstract/document/9464050

[3] **Kong, Y.** (2022). Refrigerating Container. (*WIPO Patent No*. *WO2022137104A1*). The World Intellectual Property Organization. Patent link.

[4] **Kong,Y.** (2021). Stackable Container. (*PRC No. 202130392477.X*). China National Intellectual Property Admin.

[5] **Kong,Y.** (2021). Integrated circuit test item acquisition methods, devices and related equipment. (*PRC Patent No. 202111163006.7*). China National Intellectual Property Administration

## SELECTED RESEARCH & WORK EXPERIENCE

**Jidu Automobile Co., Ltd.** *Nov 2022 – Jan 2024*

*Machine Learning Engineer, Full-time* *Shanghai, China*

- Developed rule-based trajectory prediction algorithms from scratch, such as constant velocity, constant acceleration, constant turning rate and velocity;
- Trained and Optimized trajectory prediction algorithms such as LSTM, semantic LSTM, DenseTNT and MTR;
- Deployed the trained models on Nvidia Orin by TensorRT;
- Developed basic software framework for prediction module based on Baidu Apollo open-source framework to serve as a foundation for further algorithm development;
- Built a data extraction pipe to prepare data for training and testing;
- Discussed with persons in charge of upstream and downstream modules to determine the specifications of the prediction module, such as input variables, output variables, execution time, resource allocation, etc.
- Provided mentorship to 2 interns and set step-by-step goals to help them get familiar with algorithm optimization based on case feedback.

**AutoX** *May 2022 – Oct 2022*

*Machine Learning Engineer, Full-time* *Shenzhen, China*

- Proposed a new trajectory prediction algorithm by incorporating dynamic models to optimize the current rule-guided algorithm to smooth the vehicle trajectory;
- Conducted thorough research and literature review on interaction-aware trajectory prediction models;
- Applied reinforcement learning algorithms in planning decisions such as the pull-over spot selection.

**Huawei Technology Co., Ltd** *Nov 2020 – May 2022*

*Machine Learning Engineer, Full-time* *Shenzhen, China*

- Trajectory Prediction
  - Utilized Lagrangian Relaxation to describe constraints as soft constraints and enhanced meta-heuristics and objective function to optimize the solving algorithm;
  - Beat the result from Google OR-Tools by an average of 10% on test scenarios such as capacitated vehicle routing problem, capacitated vehicle routing problem with time window constraints;
  - An academic paper was drafted based on the results of current research: https://arxiv.org/pdf/2207.09860.pdf;
  - Github Repo: https://github.com/Yanko96/Learning-to-Solve-Soft-Constrained-Vehicle-Routing-Problems-with-
- Vehicle Routing Problem
  - Sampled agent motion features from the feature map of U-Net, combining with the traffic information from rasterized HDMap as the input of Target-drivenN Trajectory (TNT) framework;
  - Preprocessed the input data from LiDAR: hard data mining with resampling dataset; differentiating hard data from easy cases; and data augmentation to avoid overfitting.

**Nokia Bell Labs** *Jan 2020 – July 2020*

*Intern, Full-time, Supervisor: Vilho Raisanen, Dmitry Petrov* *Espoo, Finland*

- Built a novel algorithm that can be used to predict networks' path performance based on link and node features;

- Optimized the model structure to achieve better scalability with up to 2x speedup with no accuracy loss in the face of large-scale networks;
- Published one academic paper at *IEEE International Symposium on Integrated Network Management (2021)* based on the research results: https://ieeexplore.ieee.org/abstract/document/9464050
- Github repo: https://github.com/Yanko96/MPNN

## SKILLS

- Computer vision (Python/C with OpenCV)
- Reinforcement Learning (PyTorch/ Tensorflow)
- Combinatorial Optimization
- Programming (Python, C++, R, MATLAB)
- Excellent communicator
- DNN Deployment (TensorRT/ONNX/LibTorch/ TensorRT)
- Deep Learning
- Database Management (MySQL/ SQLite)
- Fast learner & system thinking