Dang Le Dang Khoa

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Technical Skills

- **Languages**: Python (Pandas, Matplotlib, Numpy, Scikit-learn, Pytorch), C/C++ (STL, Libtorch, OpenMP), Bash/Linux (shell scripting, awk, Dockerfile)
- **Tools**: kaldi-asr, ESPnet-e2e, jupyter notebook, git, huggingface-transformer

Experience (selected)

Senior Research Engineer — **Institute for Infocomm Research (I2R) - A*STAR** — **February 2020 - Present**

Speech-to-text (Automatic Speech Recognition)

- Trained and maintained Bahasa Malay core Speech-to-Text engine and language model, improved Word-Error-Rate by 10% from the baseline model.
- Integrated and finetuned Singapore English Speech-to-Text engine into domain-specific services, including Legal, Healthcare, and Education. Including *Intelligence Court Transcription System* 🔗.
- Transformed and augmented audio and text data for model training.

Natural Language Processing - Audio,Text Analytics and Classifications

- Trained and integrated *ECAPA-TDNN* deep learning model for speaker diarization service, meeting minute note-taking application.
- Trained *U-net* audio enhancement model for Satellite-based VHF communication; performance improved by 3% compared to RNN baseline model.
- Modeled sentence embedding inference and logic backend for *Vietnamese-voiced FAQ chatbot*.
- Contributed to other team-scaled projects: *Sequence2Sequence with Attention*, *Sentiment Analysis*, *Embedded Sound Classification*.

Researcher — **Satellite Research Centre** — **August 2016 - August 2018**

- Implemented a novel Star Tracking Algorithm onto a Programmable System-on-a-chip for mini satellites.
- Optimized the pattern recognition algorithm runtime, improved the accuracy by 5% on average.
- Designed a tree-based pattern searching algorithm, improved runtime processing by 25%.

Honors & awards (selected)

AI Singapore - Trusted Media Challenge 2021

- Challenged for the detection of audio-visual fake media, a competition hosted by AI Singapore, sponsored by Singapore Press Holdings Ltd. with prize monies of up to SGD 700,000.
- Lead and contributed chief engineering work for **aasrali** team to compete with other 474 teams.
- Ranked 6th on the final stage leaderboard - Top 1% teams - Final Round Leaderboard 🔗.

ConferencingSpeech 2021 Challenge

- Challenged for Far-field Multi-Channel Speech Enhancement for Video Conferencing, hosted by Interspeech and Tencent Ethereal Audio Lab.
- Ranked in top 10 with I2R-ALI team.

Google Code Jam 2018

- Competed individually in the problem solving contest organized annually by Google with over 27,000 competitors.
- Advanced to round 2 - Top 10% candidates.

Education

Master of Engineering — **Nanyang Technological University Singapore** — **August 2015 - August 2018**

- School of Electrical and Electronics Engineering - Research.
- Thesis title: Implementation of An Autonomous Star Recognition Algorithm using Hardware-Software Co-Processing Approach.
- *Source code*: github.com/dangkhoadl/Master-Thesis-Star-Tracking-System
- *Publication*: doi.org/10.32657/10220/48371

Bachelor of Engineering — **Vietnam National University - HCM, University of Technology** — **August 2010 - April 2015**

- Major: Electrical and Electronics Engineering, Minor: Automation System Design. Second Upper Honour
- Thesis title: Applying of Fuzzy Logic Algorithm on Legged Locomotion Robot.

Open-Source Projects (selected)

WER-in-CPP

- Developed an open-source API to calculate Word-Error-Rate for ASR project based on Minimum-Edit-Distance Dynamic Programming problem.
- Added the new features of text-based visualization and WER-per-utterance for statistical analysis.
- *Source code*: github.com/dangkhoadl/WER-in-cpp

Machine Learning and Algorithms Repositories

- Maintain GitHub repositories for personal note-taking, introducing and mentoring students to Data Structures - Algorithms, and Machine Learning.
- Solved multiple problems in Computer science (Traveling Salesman, Stable Marriage Matching, etc.) and Machine Learning (Random Walks, AI bot playing the trending mobile game *Lyto Different Color*).
- *Data structures and Algorithms implementation*: github.com/dangkhoadl/my-CS-Notebook
- *Discrete Optimization Algorithms implementation*: github.com/dangkhoadl/Coursera-Discrete-Optimization
- *Machine Learning and Deep Learning models implementation*: github.com/dangkhoadl/Machine-Learning-model-implementation

Certifications (selected)

- Coursera - Discrete Optimization - 🎓
- Coursera - Machine Learning Specialization - 🎓
- Coursera - Data Structures and Algorithms Specialization - 🎓
- Udacity - Machine Learning Engineer Nanodegree - 🎓