

# 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:** kaldia-sr, ESPnet-e2e, jupyter notebook, git, huggingface-transformer

## EXPERIENCE (SELECTED)

Senior Research Engineer	Institute for Infocomm Research (I2R) - A*STAR	February 2020 - Present
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### 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. [Intelligence Court Transcription System](#) featured on Straittimes.
- 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 and Transformer, Sentiment Analysis, Embedded Sound Classification.

Researcher	Satellite Research Centre	August 2016 - August 2018
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- 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:* [git.io/vpucY](https://git.io/vpucY)
- *Publication:* <https://doi.org/10.32657/10220/48371>

<b>Bachelor of Engineering</b>	<b>Vietnam National University - HCM, University of Technology</b>	<b>August 2010 - April 2015</b>
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- 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:* <https://github.com/dangkhoai/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/dangkhoatl/my-CS-Notebook](https://github.com/dangkhoatl/my-CS-Notebook)
- *Discrete Optimization Algorithms implementation*: [github.com/dangkhoatl/Coursera-Discrete-Optimization](https://github.com/dangkhoatl/Coursera-Discrete-Optimization)
- *Machine Learning and Deep Learning models implementation*: [github.com/dangkhoatl/Machine-Learning-model-implementation](https://github.com/dangkhoatl/Machine-Learning-model-implementation)

## CERTIFICATIONS (SELECTED)

- COURSERA - DISCRETE OPTIMIZATION - [Certificate](#)
- COURSERA - MACHINE LEARNING SPECIALIZATION - [Certificate](#)
- COURSERA - DATA STRUCTURES AND ALGORITHMS SPECIALIZATION - [Certificate](#)
- UDACITY - MACHINE LEARNING ENGINEER NANODEGREE - [Certificate](#)