



# Trương Hoàng Long – CV

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**Ausländerausweis B** (employer needs to apply for work permit)

## Interests

Algorithms & Data structures, Machine learning, Functional programming, High-performance computing, Micro-controllers.

## Education

**2019-now** BSc Computer Science - ETH Zürich

**2016-2019** Computer Science Honors - VNU.HCM High School for the Gifted

## Employment History

**Sep 2020 -** ETH Zürich  
**Jan 2021** *Teaching Assistant*

I was teaching assistant for Algorithms Lab, a Master's level course on solving algorithmic problems using network flow, computational geometry (in particular Delaunay triangulations), and linear programming.

**Technologies:** CGAL (Computational Geometry Algorithms Library), BGL (Boost)

## Skills

### ■ Technologies

C & C++ — *CGAL, Boost, Eigen*  
Linux, Bash, Git  
Javascript — *Node.js*  
Python 3 — *Pandas, Numpy, Tensorflow*

### ■ Languages

*Vietnamese* — Native  
*English* — Bilingual-fluency (108/120 TOEFL iBT)  
*German* — Bilingual-fluency (80/100 Goethe Zertifikat C1, Prädikat "gut")

## Awards and Honors

**2021** Silver Medal, ICPC Southwestern European Regional Contest  
**2019** Silver Medal, Vietnamese National Olympiad in Informatics  
**2018** Silver Medal, ICPC Vietnamese National Contest  
**2018** Silver Medal, Vietnamese National Olympiad in Informatics

## Past Projects

- **Procedural Terrain Generation via Hydraulic Erosion Simulation**

A highly parallelizable program that simulates the effects of hydraulic erosion on a randomly sampled heightmap to produce realistic terrain.

**Technologies:** C++ (Qt5)

<https://github.com/KonaeAkira/erosion-sim>

- **Gomoku**

Server and client for the classical game of gomoku (connect 5, tic-tac-toe). Written in Javascript. The server runs on Node.js and the server and client communicate over websockets.

**Technologies:** Javascript, Node.js (express, websocket)

<https://github.com/KonaeAkira/gomoku>

- **Minesweeper X**

A bot based on image recognition that can play Microsoft's Minesweeper X on Windows 10.

**Technologies:** C++

<https://github.com/kuroni/minesweeper-bot>

- **IoT - Smart Greenhouse**

A greenhouse that can be monitored and controlled remotely. Built based around the Intel Galileo single-board microcomputer and the NodeMCU single-board microcontroller.

**Technologies:** Arduino, Intel Galileo, NodeMCU, Raspberry Pi

## Publications

- **Using the Shortest Path Faster Algorithm to find a negative cycle**

I propose a modification to the Shortest Path Faster Algorithm (SPFA) to efficiently detect negative cycles in weighted directed graphs.

<https://konaeakira.github.io/posts/using-the-shortest-path-faster-algorithm-to-find-negative-cycles.html>

- **Segmented SPFA: An improvement to the Shortest Path Faster Algorithm**

I propose a way to improve the constant-factor in the runtime of the Shortest Path Faster Algorithm (SPFA) on weighted directed graphs with a large amount of strongly connected components.

<https://konaeakira.github.io/posts/segmented-spfa-an-improvement-to-the-shortest-path-faster-algorithm.html>