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# Education

* **Tunku Abdul Rahman University (UTAR)** Petaling Jaya, Malaysia

*Bachelor of Information Technology (Hons) Computer Engineering May 2005 – May 2008*

* **Tunku Abdul Rahman College (KTAR)** Setapak, Malaysia

*Diploma in Science (Information Systems Engineering) Mar. 2004 – Mar. 2005*

# Experience

* **Nine**, *Sydney, Australia* Sep. 2021 – Now

**Software Engineer (Backend)** Sep. 2021 – Now **Technologies**: Golang, GraphQL, React JS, TypeScript, Kubernetes, SQS, Postgres **Responsibilities**:

* 1. Developed/maintained Nine’s new election backend system & election widgets to replace a legacy election system with a more modern infra to better handle increased user traﬀic & improved UX.
  2. Written scripts & performed data migration from legacy CQ system to Nine’s current backend as part of an effort to deprecate legacy systems.
  3. Developed/maintained Nine’s Good Food & Traveller sub-brand web site.
  4. Performed on-call duties to investigate production issues & timely deployment of features.
  5. Performed code review & peer-testing to ensure the team’s work are of high standard.
* **Canva**, *Sydney, Australia* Jan. 2021 – Sep 2021 (8 months) **Software Engineer (Backend)** Jan. 2021 – Sep 2021 (8 months) **Technologies**: Java, DynamoDB, Terraform, React JS, AWS, MySQL

## Responsibilities:

1. Developed/maintained Canva’s folder backend to improve stability & support new business requirements.
2. Designed/developed as part of a team of 3 to migrate all documents to a new data scheme to support a new View called ”Your Projects”.
3. Migrated legacy folder APIs from reading/writing to MySQL to DynamoDB as part of effort to modernize the data backend & better handle increased user traﬀic. &
4. Performed on-call duties to investigate production issues & responds to customer tickets.
5. Performed code review to ensure the team’s work are of high standard.

**Responsibilities**: Developed/maintained Canva’s Content management system.

* **Grab**, *Singapore* Jul. 2014 – Sep. 2020 (6 years, 2 months) **Senior Backend Engineer** Jul. 2018 – Sep. 2020 (2 years, 2 months) **Technologies**: Golang, Redis, JavaScript, AWS, Terraform, SQS

## Responsibilities:

1. Spearheaded & coordinated efforts to develop Snap-to-Road v3 to replace current Snap to Road system to enable real-time snapping of raw driver GPS location. System is launched with 41% reduction in latency (12ms to 7ms) & 60% reduction in AWS infra cost.
2. Developed/maintained a multi-modal route planner based on the ”Connection Scan Algorithm” to enable route planning functionality on app.
3. Developed internal visualization tools to help diagnose tricky Snap-to-Road failures.
4. Performed on-call duties to investigate production issues & responds to customer tickets.
5. Performed code review to ensure the team’s work are of high standard.

**Senior Full Stack Developer** Jan. 2016 – Jun. 2018 (2 years, 6 months)

**Technologies**: Ruby on Rails, React JS, AWS, MySQL

**Responsibilities**: Developed/maintained Grab’s various internal & public-facing web apps, e.g. Driver Onboarding Platform, Share My Ride, [Grab for Business](https://business.grab.com/), FlagsView using technologies like [Ruby on Rails](https://rubyonrails.org/), JavaScript, [ReactJS](https://reactjs.org/), [GraphQL](https://graphql.org/) & [MySQL](https://www.mysql.com/).

**Senior Node.js Developer** Jul. 2014 – Jun. 2014 (1 year, 6 months)

**Technologies**: Node.JS, AWS, MySQL

**Responsibilities**: Developed/maintained Dispatcher (one of the early core systems of Grab, responsible for notification, bidding & acceptance of all rides). Technologies like [Node.js](https://nodejs.org/), [MySQL](https://www.mysql.com/) is used.

* **YellowElevator**, *Malaysia* Jan. 2014 – Jun. 2014 (6 months)

## Senior Software Developer

**Responsibilities**: Developed/maintained YellowElevator web site. Dabble with [php](https://www.php.net/) using [Zend](https://framework.zend.com/) [Framework](https://framework.zend.com/) & [MySQL](https://www.mysql.com/) for the database, JQuery & some vanilla JavaScript on the frontend. Worked on the site’s Notifications Center. Also helped in requirement analysis & architecture design.

* **Time.ly, GuideAdvisor**, *Contract/Remote* Apr. 2013 – Oct. 2013 (7 months)

## Software Developer

**Responsibilities**: Developed/maintained a popular calendar widget for wordpress called timely & GuideAdvisor site. Developed backend [Node.js](https://nodejs.org/)-based API router that is covered by BDD test written with vows. Worked on features like filtering (selectize, select2), automatic layout (Masonry), infinite scrolling.

* **EzyPay**, *Malaysia* Jul. 2011 – Jan. 2013 (1 year, 7 months)

## Senior Developer

**Responsibilities**:

1. Helped in development/maintenance of iConnect360 Silverlight application. Dabbling with C# & .NET 4.5, Telerik RadControls for Silverlight.
2. Worked on the site’s new Booking management module & E-mail campaign management module.
3. Heavily involved in the agile process, including requirement analysis & planning/estimation meetings.

* **Panasonic R&D Centre Malaysia**, *Malaysia* Jun. 2008 – Jun. 2009 (1 year, 1 months)

## Research & Development Engineer

**Responsibilities**: Developed software that manages Panasonic’s various PBX system using the Qt library & C#. Tasked to understand existing large C++ codebase & fix bugs in existing software, performed testing on software that sometimes require interfacing with hardware & add new functionality according to hardware specifications.

# Past &

Current

# Projects

* **Snap-to-Road (Grab)**: This is a microservice to accurately position drivers. It’s built with [Go](https://golang.org/) & [Redis](https://redis.io/) as the data store. Known as “[map matching](https://en.wikipedia.org/wiki/Map_matching)” in the research community, our approach uses the hidden Markov model. Initial implementation is adapted from the paper “Hidden Markov Map Matching Through Noise & Sparseness”. As the initial author of Snap-to-Road V3, I’m involved in the initiation & planning phase & has successfully brought it to production. V3 has novel aspects not documented in the paper that enables real-time snapping that will be documented in a patent pending submission where I’m also one of the core authors. I also helped to reduce infra costs by means of code optimization (e.g. making use of Sync Pool) & revising ASG policies via [Terraform](https://www.terraform.io/).
* **Multi-modal route planner (Grab)**: This is a microservice to suggest best routing plan across various modalities, e.g. Trains, Buses and/or Grab rides. Its approach is based on the paper “Connection Scan Algorithm”. Form an initial implementation by a fellow team member, I worked on getting it production-ready, fixed critical bugs, added tests & built visualization tools for correctness verification.
* [**Grab for Business**](https://business.grab.com/): Consisting of a web portal, admin portal, revamp of Grab’s passenger app & various other integration work with the rest of Grab internal systems. The system as a whole allows businesses to manage ride policies, payment methods & employees. Employees of enrolled businesses will be able to take corporate rides in accordance to the company’s pre-set policies.
* **Driver Onboarding (Grab)**: Consisting of a web portal, admin portal, it is a system designed to improve the experience of signing up, vetting & onboarding drivers. The sign up form is designed with [ReactJS](https://reactjs.org/) & optimized to load fast & responsive even on low-end smartphones.
* **Dispatcher (Grab)**: This is one of the major backend systems used for sending/receiving of messages to/from driver such as a job broadcast to driver & handling of bidding/cancelling etc. It broadcast jobs to driver using a persistent TCP connection to the driver. It is written using [Node.js](https://nodejs.org/). It initially uses the async library for control flow. I worked on the transition to use

node-sync. I also worked on the separation of dispatcher into communication layer & logic layer to achieve graceful restart that avoids the disconnection of every driver during every deployment.

* **Rotation-invariant License Plate Detector (Final year project)**: This is a license plate detector developed with Pedro F. Felzenszwalb & Daniel P. Huttenlocher’s graph-based image segmentation algorithm (their algorithm is open source but I have to port it over to use OpenCV). It uses variance-based features & is integrated with libsvm. It is written in C++ with OpenCV. The algorithm does not achieve groundbreaking results compared to existing solutions, but it was a novel method & provides the basis for future Computer-Vision related research.)

# Awards

## The Rookie Award 2011

Awarded for being the best overall new comer of the quarter (as voted by working colleagues in EzyPay.

## The Exterminator Award 2011

Awarded for being the best bug fixer of the quarter (as voted by working colleagues in EzyPay.

## Bitwise 2009 Online Algorithm Programming Contest

Placed 33rd among 2700 teams from around the world.

## Microsoft Imagine Cup 2008 – Software Design

Placed 2nd among 5 teams in the Malaysia finals.

## Bitwise 2008 Online Algorithm Programming Contest

Placed 24th among 2911 teams from around the world.

## PanaGEEK 2007 programming competition

Top 20 in the national first round, 3rd prize in the final round.

# Skills

* **Stacks**: .NET Framework, [Ruby on Rails](https://rubyonrails.org/), [ReactJS](https://reactjs.org/), [Node.js](https://nodejs.org/), [GraphQL](https://graphql.org/), [Zend Framework](https://framework.zend.com/), [Terraform](https://www.terraform.io/)
* **Databases**: [MySQL](https://www.mysql.com/), [Redis](https://redis.io/)
* **Languages**: [Go](https://golang.org/), JavaScript, C#, C/C++, [PHP](https://www.php.net/), Java, [Rust](https://www.rust-lang.org/), Ruby, SQL
* **Methodologies**: Scrum, Kanban, Agile

# Publications

* Visual Objects Classification with Sliding Spatial Pyramid Matching, 2012

[*arxiv.org/abs/1212.3767*](https://arxiv.org/abs/1212.3767)

* Detection of License Plate Characters in Natural Scene with MSER and SIFT unigram Classifier, 2010

[*ieeexplore.ieee.org/document/5686998*](https://ieeexplore.ieee.org/document/5686998)

* Vehicle License Plate Detection using Unigram Model and Difference-of-SURF Bigram Model with SVM, 2009

[*semanticscholar.org/paper/PLATE-DETECTION-USING-UNIGRAM-MODEL-AND-BIGRAM-*](https://www.semanticscholar.org/paper/PLATE-DETECTION-USING-UNIGRAM-MODEL-AND-BIGRAM-WITH-Lim-Tay/fd81d1a75e49c0e96c57ec2a64a259ee22af99fc)[*WITH-Lim-Tay/fd81d1a75e49c0e96c57ec2a64a259ee22af99fc*](https://www.semanticscholar.org/paper/PLATE-DETECTION-USING-UNIGRAM-MODEL-AND-BIGRAM-WITH-Lim-Tay/fd81d1a75e49c0e96c57ec2a64a259ee22af99fc)

* Two-stage License Plate Detection using Gentle Adaboost and SIFT-SVM, 2009

[*ieeexplore.ieee.org/document/5175977*](https://ieeexplore.ieee.org/document/5175977)

* Fast Adaptive Graph-based Segmentation with application in Vehicle License Plate Detection, 2008 [*semanticscholar.org/paper/Fast-Adaptive-Graph-based-Segmentation-with-in-Lim-*](https://www.semanticscholar.org/paper/Fast-Adaptive-Graph-based-Segmentation-with-in-Lim-Tay/6f0128a7630687189a9fdcafd15111f8e461ebb0)[*Tay/6f0128a7630687189a9fdcafd15111f8e461ebb0*](https://www.semanticscholar.org/paper/Fast-Adaptive-Graph-based-Segmentation-with-in-Lim-Tay/6f0128a7630687189a9fdcafd15111f8e461ebb0)