

# Tony Kappen

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## EDUCATION

### UNIVERSITY OF WATERLOO

#### COMPUTER ENGINEERING

Class of 2022

## SKILLS SUMMARY

### LANGUAGES

- Golang
- C
- C++
- Java
- Python
- JavaScript
- PHP

### TECHNOLOGIES

- Git
- VueJs
- MongoDB
- NodeJS
- Linux Shell
- Docker
- React
- LLVM
- Ghidra

## PROJECTS

### ALBUM SHARING WEB APPLICATION

- Created a web application that allowed users to create collections of images and then share each specific collection via a shareable link
- The application's stack consisted of VueJs, mongoDB and GoLang. The application was deployed using heroku

### FLAPPY BIRD AGENT

- Implemented a genetic algorithm in python to create an agent capable of playing flappy bird
- Works by creating a sample population of random neural nets and iteratively finds the best network, until a well-functioning network has been created

## COURSE WORK

### COMPUTER SECURITY

- Built a secure password manager application in PHP

### SYSTEMS PROGRAMMING AND CONCURRENCY

- Design, debug and optimize C programs that make use of concurrent processes

## EXPERIENCE

### UNIVERSITY OF WATERLOO | RESEARCH ASSISTANT

May 2020 - August 2020

- Utilized the reverse engineering tool Ghidra to analyze and annotate binaries to assist in identifying potential vulnerabilities
- Implemented a modified version of the Weisfeiler-Leman graph isomorphism test algorithm ([paper](#)) to compare two graphs and obtain a similarity percentage. This tool was used to determine the similarity between two programs by comparing the similarity score between various graphs that describe them (ex. call graph, memory graph, control flow graph etc.)
- Assisted in scaling up the binary lifter [Ghidral](#) to successfully lift (i.e. decompile a binary to LLVM intermediate representation) a larger set of binaries

### EMAILTOPIA | FULL STACK DEVELOPER

September 2019 - December 2019

- Used Golang and VueJs to develop, test and deploy new features to emailtopia's email management software product. An example of a feature I implemented was an alerts functionality that enabled users to receive notifications of unanswered emails at their desired frequency.
- Performed the necessary restructuring of the existing MongoDB database to allow for newly requested functionality while maintaining existing functionality.

### POINTCLICKCARE | SOFTWARE DEVELOPER

January 2019 - April 2019

- Utilized the Spring Boot Stack for Java to add functionality to existing API endpoints
- Contributed to the creation of a patient visit scheduler web app for doctors in React by creating a calendar component

### BANK OF AMERICA | QUALITY ASSURANCE ANALYST

May 2019 - August 2019

- Automated the testing of an application using the Selenium Webdriver's libraries for Java along with the TestNG framework
- Automation reduced the time required to perform testing from 5 days to 2 hours

### INSTITUTE OF QUANTUM COMPUTING | RESEARCH ASSISTANT

January 2016 - April 2016

- Designed and built custom circuits on a solder-able breadboard to meet custom laboratory needs
- Became more detail oriented and meticulous after placing multiple orders on equipment worth over \$5000 CAD, ensuring that proper design specifications were met