Sean Purcell

Software Engineer
seanp.xyz

seanp.xyz
me@seanp.xyz
iburinoc
647-975-7594

Summary of Qualifications

- 4 years of experience with each of C, C++, Java, Python in projects and work experience.
- Familiar with ASM, Javascript, LaTeX, MATLAB through school and self teaching.
- Award winning use and understanding of algorithms and data structures at the CCO.
- Advanced understanding of cryptographic algorithms and principles through personal projects.
- Adept at rapid prototyping and experimentation from hackathon experience.

Work Experience

2015   **Software Engineering Intern**, *Sunnybrook Research Institute*, Toronto, ON.

Created, improved, and optimized software used in Medical Biophysics Research.
- Optimized differential equation-solving simulator to operate twice as fast as original.
  - Worked with C++, using OpenMP and MPI for parallelization.
- Installed job scheduler on cluster to manage allocation of memory and compute nodes.
- Created GUI using Python to operate simulator for use by Medical Doctors.
- Managed compute cluster system administration and backups.

Awards and Achievements

2015   **Winning Team, Hack the North (AnonymEyes)**, Waterloo, ON.

Built a location-based video streaming app for emergency response and evidence collection.
- One of the top twelve hacks out of over 250 entries, at Canada's largest hackathon.
- Designed and implemented custom video stream from Android to receiving server over UDP.

2015   **Gold Medalist, Canadian Computing Olympiad**, *CEMC*, Waterloo, ON.

National algorithms programming contest written by over 3,500 secondary students.
- Placed 5th overall across three contest days and 11 problems of varying complexity.
- Used concepts such as graph theory, dynamic programming, and runtime analysis.

2015   **2nd Place Team, Tech Retreat (Resistora)**, Waterloo, ON.

Created a mobile app to read the resistance value of a resistor using the phone camera.
- Developed custom computer vision algorithms to recognize band locations and colours.
- Integrated Android Camera API, utilized Mathematica for data analysis.

Projects

2014-2015   **ibcrypt**, *https://github.com/iburinoc/ibcrypt*.

Built a library contaning implementations of standard cryptography algorithms in C.
- Implemented algorithms such asAES, RSA, Diffie-Hellman, SHA256, CHACHA, and scrypt.
- Allowed for use of public and secret key encryption, hashing, and random number generation.

2014-2015   **ibchat**, *https://github.com/iburinoc/ibchat*.

Used ibcrypt to build a 14,000 line messaging program featuring end-to-end encryption.
- Devised a public-key infrastructure that does not require trusting the server.
- Constructed custom network protocol for secure communication with perfect forward secrecy.

Education

2015–2020   **Candidate for Bachelor of Software Engineering**, *University of Waterloo*.

2014   **Student in Compilers and Algorithms Courses**, *Stanford University*.

2011–2015   **High School Diploma**, *Math and Science Enrichment Program (TOPS)*, Toronto, ON.