

Sean Purcell

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Summary of Qualifications

- 4 years of experience with each of C, Java, C++ in projects and work experience.
- Familiar with ASM, Python, JavaScript, MATLAB through school and self teaching.
- Award-winning use and understanding of algorithms and data structures at the CCO and ICPC.
- Strong 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.
 - Managed compute cluster system administration and backups.

Projects

- 2014–2015 **ibchat/ibcrypt**, <https://github.com/iburinoc/ibchat>.
Built a toy end-to-end encrypted messaging program from scratch in POSIX C.
- Implemented algorithms such as AES, RSA, Diffie-Hellman, SHA256, CHACHA, and script.
 - Constructed custom network protocol for secure communication with perfect forward secrecy.
- 2015 **AnonymEyes**, *Winning Team, Hack the North*, <http://anonymeyes.co>.
Built a location-based video streaming app for emergency response and evidence collection.
- Designed and implemented custom video stream from Android to receiving server over UDP.
 - Built a web app showing streamed videos, interfacing the Google Maps API to show position.
- 2015 **Resistora**, *2nd Place Team, Tech Retreat*.
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.
- 2015 **Flightsim**, <https://github.com/iburinoc/flightsim>.
Wrote a 3D flight simulator in C++, interfacing OpenGL directly for rendering.
- Featured coherent random noise generation for varied infinite terrain.
 - Used the TI Launchpad board to implement a physical joystick for use with the simulator.

Awards and Achievements

- 2015 **3rd Place Team**, **ACM International Collegiate Programming Contest, ECNA Regional**, Windsor, ON.
International algorithm and data structure programming competition written by 130 collegiate teams.
- 2015 **Gold Medalist**, **Canadian Computing Olympiad, CEMC**, Waterloo, ON.
National algorithms programming contest written by over 3,500 secondary students.
- 2015 **Honorable Mention**, **Beamline for Schools, CERN**.
International contest to submit an experiment proposal for CERN, placed within top 15 teams of 119.

Education

- 2015–2020 **Candidate for Bachelor of Software Engineering**, *University of Waterloo*.
- 2014 **Student in Compilers and Algorithms Courses**, *Stanford University*.