Rahat Dhande

Robotics Software Engineer with industry experience in general purpose robots and background in theoretical physics and math.

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EXPERIENCE

Sanctuary AI Vancouver, BC

Software Engineer May 2019 - Present

- Designed and developed a cognitive architecture and platform for general purpose robots used to support 6 different generations of robot embodiments and capable of completing data collection, training, tuning, troubleshooting, and deployment of AI/ML models within a 2.5 week period.
- Maintained a codebase of more than 150 interdependent projects pertaining to robot perception, planning, navigation, reasoning, controls, simulation, and teleoperation, enabling up to 80 engineers and researches to work in tandem on challenging problems.
- Built a telerobotics system that enables humans to analogously and remotely pilot a robot; system was critical in building the company's public image by enabling both the consistent creation of media content (`https://www.youtube.com/@sanctuaryai/videos`; `https://www.instagram.com/sanctuary.ai/`) and deployment of robots in a commercial environment (`link`).
- Implemented novel algorithm to improve humanoid robot motion plan success rate by 2.3x and speed up performance by 3x.
- Collaborated across various groups and disciplines resulting in multiple successful projects in open fields of research.

D-Wave Vancouver, BC

Applications of Quantum Annealing, Co-op May – Aug 2018

- Investigated the impact of noise and measurement distortion in the context of quantum simulations by measuring time, space, and coupling strength dependencies in data using statistical methods such as non-linear regression and principle component analysis.
- Discovered previously unknown cyclic anomalies in time-series data, which provided important feedback to D-Wave's Processor Development group to improve noise-to-signal ratio and enable more complex experiments.
- Operated D-Wave's Quantum Computer seamlessly and managed large datasets using data compression resulting in efficient use of hardware computation time and several successful experiments.
- Effectively documented experiment motivation and results, with appropriate use of figures and visualizations, as well as suitable mathematical content; maintained stable, well-structured code repositories resulting in improved visibility across the organization.

BC Children's Hospital Vancouver, BC

Application Developer, Co-op `http://rahatchd.github.io/littlehearts` Jan 2016 – April 2016

- Developed a webapp that allows users to view and interact with 3D heart models, to be used as an educational aide for patients of congenital heart disease, medical professionals.

PROJECTS

Increment Fitness Vancouver, BC

Project Link: `https://github.com/rahatchd/reports/blob/main/Automated_Fitness_Tracking.pdf` Sept 2017 – May 2018

- Built an end-to-end prototype to track a gym user's exercises, weights, and repetitions; this data was uploaded and made available to the user in real time through a web client.
- Using depth-sensing cameras, built an exercise classification system (97% accuracy), a repetition counting system (84% accuracy), and a weight detection system (99% accuracy).
- Conducted market research and competitive landscape analysis through surveys, interviews, and case studies.

Rock-the-Boat Vancouver, BC

Project Link: `https://rahatchd.github.io/rock-the-boat` Jan – April 2017

- Built an interactive physics engine that uses Lagrangian mechanics and numerical methods to simulate the behaviour of any hand-drawn boat in inviscid fluid; rendered the simulation using WebGL on a website.

UberBots Robot Competition Vancouver, BC

Project Link: `http://rahatchd.github.io/das_pan` (includes interactive robot) May - Aug 2016

- Built an autonomous robot that intelligently navigates a city, avoiding collisions with other robots, picking up dolls and delivering them to the destination; optimized path finding using an intelligent navigation algorithm.
- Developed libraries for robot actuation and sensing, and intelligent path finding in C++; the libraries were later reused in a Senior Design competition by teammate for a different robot, enabling them to iterate faster and place 2nd in the country.

EDUCATION

University of British Columbia, Vancouver, BC September 2014 - May 2019

Bachelor of Applied Science in Engineering Physics with Minor in Honours Mathematics

Graduated with Distinction

AWARDS

- Dean's Honour List (4) May 2016 – May 2019
- NSERC Industrial Undergraduate Student Research Award May 2018 – Aug 2018
- Trek Excellence Scholarship (3) Sept 2015 – Sept 2017
- Eric Roenitz Memorial Award Feb 2019
- Bycast Award To Promote Entrepreneurship ($10,000) Feb 2018
- Design and Innovation Day Industry Award Mar 2018
- S. Cyril Maplethorp Memorial Scholarship in Engineering Sept 2016