PaulRosa

contact

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interests

hci, gamification, accessibility, virtual reality, wearables, iot, 3D printing, robotics, cybersecurity, machine learning, natural language processing, embedded systems, computer graphics, distributed systems, cryptography, space

skills

best C#, Java, HTML5, Wolfram, Mathematica, JavaScript, Typescript, WebGl, ASP.Net MVC, vNext, C, 3D Printing, HCI, ROS, Unity3D, Linq, Db, Algorithms, Data structures

good OpenCV, C++, Arduino, Twilio, Kinect, node.js, Software Architecture, Git

fluent Sql, R, Octave, Bootstrap, Angular, Oculus Rift, Google Design Sprints, Optimization, Android, Android Wear

education

2015–2018 **B.S.** in Computer Science (James Scholar) — **University of Illinois Urbana-Champaign**

2013–2015 **Self Schooled** — I never let my schooling get in the way of my education.
I took MOOCs, read books, and built robots. Classes: Stanford Artificial Intelligence, Haptics, Databases, Game Theory, Organizational Analysis, and Patient Engagement Design. Duke Bio Electricity. UPenn Gamification. MIT Digital Signal Processing. Princeton Data Structures, Algorithms.

2012–2013 **Illinois Mathematics and Science Academy** — IMSA
Head of Titan Robotics Programming Team: recruited, trained, and lead team; highest autonomous score in Midwest regional. Student Representative to British Consulate (Raspberry Pi for STEM)

projects

2013–2015 **AutoChair : An eye controlled self driving robotic wheelchair** — It's a nursing home on wheels.
Created to restore my Grandma's ability to interact with the world. A huge amount of problem solving, debugging, research, ROS, Google Design Sprints, and Git.

- prototypes, simulation, and automatic testing with C#+Unity3d, and Wolfram
- safe, highly redundant, distributed system architecture
- custom holonomic drivetrain for unparalleled mobility
- eye tracker hw+algorithm (Presented @ ROSCon 2014) using Python, OpenCV
- prototype telepresence interface for Oculus Rift
- innovative eye-controlled HCIs, multi-player games, and remote monitoring system with HTML5, JS, Typescript, WebGL, Node.js, Socket.IO
- custom quadrature encoders and motor controllers DSP, Arduino
- ROS plugin-play system for automatic customization
- novel performant terrain classification algorithm Wolfram, C#, C++, Kinect
- 1-Arduino 12-ultrasound parallel array with multi-path protection in C
- system for interfering with devices (tv, phone) using eyes, C#
- algorithm to measure stress, math to reduce

2011–2012 **C-Chat : A Browser-based AAC system** — Invented for Grandma
I developed a system that allows people with ataxia to make phone-calls from any browser. Created typo-resistant auto-complete algorithm. Researched and developed many innovative accessible HCIs. NLP, Twilio, C#, ASP.NET, JavaScript, HTML5, Hashmap

experience

2015–Now **Professor LaValle's Lab** — University of Illinois Urbana Champaign
Developed a GPU algorithm for preparing a panoramic video stream for VR.

2014–2015 **Assistive and Rehabilitation Robotics Laboratory** — Northwestern University
Developed a real-time distributed system that coordinated hundreds of process across several computers. Calibrated odometry. Created an very efficient and safe learning terrain classification algorithm. Developed a remote heart-rate monitor that measures stress as a parameter for collaborative control systems.

2012 **Digital Forces Corporation** — Illinois
Designed and Programmed a secure, low-power program for Raspberry Pi that tracks and bills trucks using RFID and Computer Vision.