

Alexander Volkov

Robotics, Mechatronics, & Controls

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EXPERIENCE

Mechatronics / Robotics Engineer

Berkshire Grey

Sep. 2018 – Apr. 2019

Lexington, MA

... Developed software interfaces to custom hardware, designed safety and power control cabinets, debugged and repaired various robotic machines, constructed robot testing equipment, and assisted in the design of future system prototypes.

Graduate Researcher

Manipulation Lab, The Robotics Institute: Prof. Matt Mason

Aug. 2016 – Aug. 2018

Pittsburgh, PA

... Investigated modern modeling and control techniques for dynamic robot manipulation and locomotion.

Lab Technician

Robotic Personal Assistants Lab, Cornell University: Prof. Ross Knepper

Oct. 2015 – Dec. 2016

Ithaca, NY

... Designed system architecture for a remote controlled car retrofitted for autonomous operation. Assisted in the initial system design of a custom autonomous blimp designed for long-deployment NDVI and atmospheric measurement.

Undergraduate Researcher

Laboratory for Intelligent Machine Systems, Cornell University: Prof. Ephraim Garcia

Oct. 2015 – Dec. 2016

Ithaca, NY

... Designed and constructed a custom, high-power and high-bandwidth linear dynamometer for testing fluidic artificial muscles. Also assisted in the design, construction, and testing of a human-size bipedal walking machine, used to study the energetics of human locomotion.

Undergraduate Researcher

Creative Machines Lab, Cornell University: Prof. Hod Lipson

Oct. 2015 – Dec. 2016

Ithaca, NY

... Developed hardware implementations of cellular soft robots evolved in simulation for locomotion. Additionally, assisted in research into novel soft-robot actuation techniques.

Hardware Intern

Vecna Robotics

Jun. 2014 – Aug. 2014

Cambridge, MA

... Internship focused on mobile hydraulic pump system construction, characterization, and analysis.

SKILLS

Mechatronics: Multi-domain physical modeling, controls & state estimation, sensor and actuator selection, OEM component integration, microcontroller firmware design, ML/AI for automation

Maker: Rapid prototyping (software/electronics/hardware), reverse engineering, debugging, field repairs

CAD Software: Solidworks, Ansys, Altium Designer, EagleCAD, SPICE, Blender (learning)

Programming Languages: Python [4/5], MATLAB + Simulink [3/5], C [3/5], C++ [2/5], Rust (learning) [1/5]

Typesetting Languages: \LaTeX [4/5], Markdown [4/5]

Human Languages: English [5/5], Russian [4/5]

EDUCATION

Master of Science, Robotics (in progress) Aug. 2016 – Dec. 2019
The Robotics Institute, Carnegie Mellon University Pittsburgh, PA
Thesis: “The Art of Robotics: Toward a Holistic Approach”¹

Bachelor of Science, Electrical & Computer Engineering Aug. 2012 – May 2016
Cornell University Ithaca, NY
Minors: Computer Science, Mechanical Engineering
Final GPA: 3.85 (Magna cum laude)
Concentration: Mechatronics, Robotics

TEACHING

Finch Robot Programming with Scratch Jun. 2017, Jun. 2018
CMU Gelfand Center Pittsburgh, PA
... Prepared and taught four sessions of a 20 hour introductory robotics course for 4th/5th graders.

Undergraduate Teaching Assistant Aug. 2014 – May 2016
Cornell University Ithaca, NY
Courses: ECE Practice and Design, Robotic Manipulation, System Dynamics, Mechatronics

AWARDS

Hunter R. Rawlings III Cornell Presidential Research Scholarship Aug. 2012 – May 2016
Cornell University Ithaca, NY

Engineering Dean’s List Aug. 2012 – May 2016
Cornell University Ithaca, NY

PUBLICATIONS²

Sensorless Pose Determination using Randomized Action Sequences. 2019
P Mannam, A Volkov, R Paolini, G Chirikjian, M Mason Entropy

Linear dynamometer testing of hydraulic artificial muscles with variable recruitment. 2017
J Chipka, MA Meller, A Volkov, M Bryant, E Garcia Journal of Intelligent Material Systems and Structures

Improving actuation efficiency through variable recruitment hydraulic McKibben muscles. 2016
M Meller, J Chipka, A Volkov, M Bryant, E Garcia Bioinspiration & Biomimetics

OUTREACH

Covestro PRSEF Sponsor Judge Mar. 2017
CMU Gelfand Center Pittsburgh, PA

Cornell Alternative Breaks Program Jan. 2015 – Apr. 2015
Cornell University & Mountain Lake Academy Lake Placid, NY

Cornell IvyQ 2015 Planning Committee Dec. 2014 – Nov. 2015
Cornell University Ithaca, NY

Notes

¹In my master’s thesis, I argue that robotics should be studied as an independent scientific field that captures the unique properties, challenges, and inter-disciplinary scope of intelligent autonomous systems.

²Happy to provide copies upon request; also available at www.rustechstudio.com/papers