Ben Kolligs | Graduate Student

510-219-5354 | benkolligs.com **|** benkolligs@gmail.com **|** www.linkedin.com/in/benjaminkolligs

EDUCATION

Carnegie Mellon University – School of Computer Science   **May 2022**
Master of Science in Robotic Systems Development | 4.0   Pittsburgh, PA
Honors: James R. Swartz Entrepreneurial Fellow
Selected Coursework: Computer Vision, Manipulation Estimation & Control, Robot Autonomy, Mobile Robots

Lewis & Clark College   **May 2018**
Bachelor of Arts in Physics with Honors, Minor in Mathematics | 3.56/4   Portland, OR
Thesis: Numerical Methods in Computing Renyi Entropy overseen by Dr. Mohamed Anber

SKILLS

Design Workflows: SolidWorks, Altium Designer, Fusion 360, Autodesk EAGLE, ABB RobotStudio, 3D printing
Programming Languages: Python, C++, C, MATLAB, Julia, RAPID
Key Skills: ROS, robotics kinematics & dynamics, motion planning, controls engineering, PCB conception & design, robot manipulator programming, software architecture design & engineering, computer vision
Hobbies: Improv comedy, flying planes

EXPERIENCE

ProtoInnovations LLC   **May 2021 – August 2021**
Robotic Software Engineering Intern   Pittsburgh, PA
- Performed research and development on planetary rover terrain manipulation behavior planning and control
- Designed and wrote perception, controls and planning software in Python and C++ to enable terrain manipulation actions and demonstrated development for NASA.

KEEN Footwear   **February 2018 – January 2020**
Robotics Engineer   Portland, OR
- Programmed ABB robots and analyzed data using Python and C++ scripts to test commercial viability of the UNEEKBOT, as the lead engineer for robotics' innovation
- Designed an electromechanical device that reduced UNEEKBOT's error rate by 50%
- Acted as the main field engineer for the UNEEKBOT Tour, collaborating with marketing and sales teams to create marketing activations attracting over a million new fans
- Trained staff in US and Japan, Hong Kong to use UNEEKBOT system with confidence, enabling three three-week marketing events to occur where up to 80,000 potential customers interacted with brand

ROBOTS

MoonRanger Lunar Rover – Carnegie Mellon University   **November 2020 – Present**
- Designed flight software architecture with accompanying architectural driver document and dynamic view diagram, enabling the start of writing flight software components in NASA's Core Flight System (cFS)
- Serving as software engineering team lead for state estimation and implemented a transform-based kinematic vehicle model in C++. Currently leading implementation of an EKF to filter IMU data, and visual odometry to estimate translation in C++.

Dragoon Disaster Response Robot – Carnegie Mellon University   **August 2020 – Present**
- Designed system requirements, system architectures, and technical subsystem descriptions
- Designed and wrote overall ROS architecture in C++ which allowed all perception, control, and classification algorithms to interface with each other
- Led development of the autonomy stack, which included the behavioral executive, explorative RRT global planner, and a local RRT for obstacle avoidance in C++.

PUBLICATIONS

Anber, M.M., Kolligs, B.J. Entanglement entropy, dualities, and deconfinement in gauge theories. *J. High Energ. Phys.* **2018,** 175 (2018). https://doi.org/10.1007/JHEP08(2018)175