

William L. Spies II

 <https://github.com/spieswl>

 www.spieswl.com

 resume@spieswl.com
 <http://www.linkedin.com/in/spieswl2>

SKILLS, STANDARDS, AND TOOLS

C++ 11/14/17	Boost, Eigen	Fanuc Robot Tooling	ISO 13849, ISO 26262
Python 3	OpenCV, PCL, CUDA	Atlassian Suite	NFPA 70E
Go	Git, CMake, Docker	MS Office Suite	Budget & Labor Estimation
ROS 1 / 2	Google Test	ANSI/RIA R15.06	Leadership Development

HISTORY

Viam, Inc.

Lead Software Engineer, Motion

Remote - New York, NY

September 2022 – May 2023

- Lead development and deployment of the Motion Planning (a.k.a. **Motion**) service within Viam's Robot Development Kit (RDK).
- Developed, solicited feedback on, and presented roadmap for Motion evolution to senior leadership and broader organization.
- Managed team Agile board in JIRA, collaborated on task prioritization with Product department, and held team accountable.
- Directed development of Motion software (written mostly in Go), participated in comprehensive code reviews, oversaw unit and integration testing, and dispatched personnel for hardware-in-the-loop tests when necessary.
- Developed and maintained the Motion Quality Assurance plan.
- Authored tutorials on setup, configuration, and use of the Motion service aimed at prospective users of the RDK.
- Coordinated cross-team involvement and collaboration on features involving multiple Viam teams, i.e. Vision and SLAM.
- Wrote integration with Open Motion Planning Library (OMPL) to benchmark and compare internal motion planning algorithms.
- Managed team of three engineers across three time zones.

Outrider Technologies, Inc.

Senior Software Engineer, Robotics - TrailerConnect

Golden, CO

October 2021 – August 2022

- Managed active collaboration between TrailerConnect and Computer Vision and Machine Learning departments.
- Responsible for continued improvement of TrailerConnect perception software, interfaces, and tooling.
- Collaborated with other TrailerConnect engineers on Remote Assistance mechanisms for supporting detection, classification, and system recovery capabilities.
- Authored, integrated, and supported software interfaces to Ethernet/IP Turck block I/O modules, SMC pneumatic manifolds, and SMC digital I/O modules.
- Responsible for performance analysis of advanced prototypes and generating corrective recommendations.
- Served as TrailerConnect representative and voting stakeholder on organization-wide safety council.
- Advised organization system safety personnel on TrailerConnect safety requirements and safety validation.

Robotics Software Engineer - TrailerConnect

March 2019 – October 2021

- Authored, integrated, and supported ROS and native C++11 code for TrailerConnect Obstacle Detection / Obstacle Avoidance software, hardware interface software, perception software, simulation software, and configuration management.
- Contributed improvements and optimizations to highest-level TrailerConnect finite state machine.
- Responsible for commissioning of Yaskawa GP7 robot arms, Intel RealSense cameras, SICK safety LIDARs, embedded VersaLogic computers, and other electronic devices.
- Pioneered data collection tools for assessing system performance with respect to commercial and engineering objectives.
- Prepared Machine Safety Risk Assessment (compliant with ANSI/RIA R15.06) on the TrailerConnect robotic system.
- Validated use of SIL3/Cat4 components and robot controller features to mitigate risks to property and personnel.
- Directed development of documentation outlining system operation, support procedures, and hardware configurations.
- Participated in Agile sprint planning, task time estimation, and task dependency organization.

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HISTORY (continued)

Northwestern University

Evanston, IL

Research Scientist - Computational Photography Lab (CPL)

June 2018 - December 2018

- Spearheaded joint effort between Computational Photography Lab and NU ACCESS to leverage Python, WebRTC, and consumer-grade Android tablets for 3D surface scanning using structured light projection and deflectometry.
- Spearheaded effort with Dr. Florian Willomitzer to adapt Flying Triangulation ([arxiv:1305.4168](https://arxiv.org/abs/1305.4168)) from MATLAB source code to C++17, modernized with Eigen, OpenCV, and PCL library features.

Master of Science, Robotics

September 2017 - September 2018

- Robotic applications of computer vision (e.g. visual odometry, 3D reconstruction, camera calibration, pose estimation).
- Embedded systems programming in modern C++ (11/17) and Python, including heavy usage of ROS.
- Implementing kinematic and dynamic control of 6-DoF robotic systems and mobile manipulators.

ATS Automation

Lewis Center, OH

Systems Project Engineer; Laser Safety Officer

February 2017 - August 2017

- Orchestrated team of 12 engineers with more than 100 collective years of PLC, HMI, and robot programming experience on industrial automation systems for First Solar, General Motors, Tesla, Oral-B, Doosan, and other customers.
- Aggregated ongoing project status and reported engineering progress to division leadership on a weekly basis.
- Assembled initial project task lists, designed high-level architecture for early-stage projects, anticipated manpower needs, and coordinated with other engineering disciplines from project launch through customer installation.
- Developed material and labor estimates (scope up to 10,000 human-hours) for sales department on an as-needed basis.
- Coordinated with sister ATS divisions on code standard development for use across entire global organization.

Systems Software Engineer; Laser Safety Officer

September 2015 - February 2017

- Designed, implemented, and validated machine control software as lead programmer of industrial automation systems for First Solar, Doosan, 3M, and other customers.
- Integrated safety systems, data handling infrastructure, and human-machine interfaces per individual customer requirements.
- Programmed and integrated Fanuc industrial robots for material handling and machine vision applications.
- Coordinated schedules, task lists, and action items for associate project team members.
- As Laser Safety Officer, handled matters of safe laser integration, operation, and maintenance through authoring workspace policies and performing optical calculations facilitating safe handling of Class 3 / Class 4 industrial lasers.

Electrical Design Engineer

June 2012 - September 2015

- Designed, integrated, and supported electrical controls and power infrastructure of industrial automation systems for Dow Chemical, General Motors, TRW, and other customers.
- Served as lead controls engineer for General Motors EV/HEV battery assembly systems with budgets exceeding \$2 million USD.
- Participated in internal and custom-facing design reviews as part of formal design approval processes.
- Coordinated with assembly teams for install supervision and testing of control systems throughout system commissioning.
- Participated in validation of safety systems in compliance with ISO 13849 and ANSI/RIA R15.06 standards.

University of Cincinnati

Cincinnati, OH

Bachelor of Science, Electrical Engineering

June 2007 - June 2012

Minor in Photonics

PUBLICATIONS & PATENTS

1. Florian Willomitzer, Chia-Kai Yeh, Vikas Gupta, William Spies, Florian Schiffers, Aggelos Katsaggelos, Marc Walton, and Oliver Cossairt., "Hand-guided qualitative deflectometry with a mobile device," Optics Express 28, 9027-9038 (2020)