NATHANIEL J. KAISER

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PROFILE Experienced professional with 5+ years in industry. Extensive knowledge of electro-mechanical systems from core engineering concepts to high-level system design. Currently pursuing a Master's Degree in Robotics, passionate about the future of technology. Career ambition is to develop complex, consumer-facing robotic systems in a fast-paced and challenging environment.

EDUCATION

Masters of Science in Robotics, Northwestern University **(9/2016 – Present)**

- GPA: 3.91/4.00, expected graduation: December 2017
- Areas of focus: autonomy, navigation, controls, localization and planning, SLAM, machine learning, AI, computer vision, perception and sensors, algorithms, embedded systems, mechatronics
- Relevant projects and coursework can be found at: njkaiser.github.io/portfolio

Bachelors of Science in Mechanical Engineering, Iowa State University **(8/2007 – 5/2011)**

- GPA: 3.79/4.00, graduated with distinction: *magna cum laude*
- Deeply involved in co-curriculars, student clubs, and technical projects

SKILLS

Software Development: C/C++, Python, Git/GitHub, Linux, MATLAB/Simulink
Robotics-related: ROS, OpenCV, PCL, Navigation Stack, SLAM, RViz, Gazebo
CAD/CAM: Creo Parametric, Pro/Engineer, SolidWorks, Inventor, Fusion 360, AutoCAD
PLM Tools: Teamcenter, Pro/Intralink, Autodesk Vault
Analysis: Pro/Mechanica, Minitab, Weibull analysis, FMEA, familiar with CFD packages
General: Microsoft Office, Visual Basic for Applications
Certifications: Six Sigma Green Belt certified through Caterpillar (June 2013)
Cultural: intermediate Spanish language abilities, familiar with Latin American culture

EXPERIENCE

Design Engineer, Caterpillar Inc. *- Advanced Electric Drive Systems* **(6/2011 – 9/2016)**

- Revolutionized Caterpillar's product line by developing electromechanical drivetrain systems and components and integrating into a diverse portfolio of mining and construction equipment
- Ideated and championed new and innovative designs from initial concept to production launch
- Managed design activities within a cross-functional team and collaborated with several external supporting groups to maintain rigorous and dynamic schedules
- Made critical decisions given limited information to meet demanding program timelines and budgets
- Responsible for continually driving manufacturing process improvements and cost reductions (up to 13%) via virtual product development and supplier collaboration
- Refreshed existing customer requirements and revamped corresponding engineering specs
- Pioneered new methodology for life improvement: employed analytical methods to pinpoint root causes of field failures and gain a deeper understanding of product issues affecting system life
- International experience supporting and vetting dealer facilities onsite (South America)

PROJECTS

Computer Vision – concepted vision algorithm to estimate robot pose using optical flow and sensor fusion, implemented on real robot using ROS and OpenCV in C++

Autonomous Navigation – configured differential drive robot and LIDAR unit, wrote new software for point cloud filtering and path planning and integrated with ROS Navigation Stack

Machine Learning & Artificial Intelligence – series of mini-projects designing a diverse set of algorithms in Python, testing on real robot data, and comparing results with other algorithms

Team PrISUm Mechanical Director – managed Mechanical Team of student-run organization which designs, builds, and races solar-powered electric vehicles

CNC Router Table Project – conceptualized, designed, built, and tested a homemade CNC router table from scratch over the course of 2 years