

SAHIL AVINASH DESHPANDE

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PROFESSIONAL EXPERIENCE

Siemens Energy Global GmbH & Co. KG, Erlangen, Germany—HVDC Control & Protection Engineer Feb 2025 – Present

- Designed and implemented open and closed-loop control systems for HVDC applications using MATLAB/SIMULINK, conducting verification through software-in-the-loop (SIL) and hardware-in-the-loop (HIL) testing environments using Beckhoff IPCs.
- Collaborated with cross-functional teams to clarify technical requirements, prepared design specifications and documentation, and contributed to the development and validation of control and protection algorithms for HVDC systems.

SLB Ltd., Houston, TX—Control and Automation Engineer Feb 2023 – Dec 2024

- Spearheaded the integration of fast-loop control applications—including Top Drives, Mudpumps, Power Management, and Drawworks—into SLB's DrillSync Automated Controls Platform using Omron PRECISE Rig Control Systems, significantly enhancing drilling efficiency and reducing well construction time through analytics-driven automation.
- Developed and maintained custom PLC and HMI software using Beckhoff TwinCAT, Omron CX Programmer, and Wonderware InTouch; tuned VFDs (ABB ACS 800/880, Yaskawa A1000, G5HHP) for optimal performance, streamlined OT software development with CI/CD and version control, and led design, commissioning, and remote support for 10+ drilling automation systems.

Rivian Automotive Inc., Palo Alto, CA—Automation and Control Development Intern May 2022 – Aug 2022

- Spearheaded the modularization of complex manufacturing body shop fixture systems by breaking them down according to the ISO/IEC 81346 standard, enabling the implementation of reusable and scalable functional electrical systems.
- Created a Configurator and Automatic Generator tool in EPLAN EEC using object-oriented programming, streamlining the design process by automating the generation of electrical schematics and Rockwell PLC code, reducing overall engineering time by 35%.

Honeywell International Inc., Roseville, CA—Electrical Controls Intern Jan 2022 – Apr 2022

- Developed control systems for automated material handling applications by creating electrical layouts and network architecture diagrams in AutoCAD Electrical, setting up communication interfaces like Ethernet IP and Profibus, and building HMI screens.
- Commissioned control systems on site by generating custom control logic for conveyors, sorters, palletizers, and ASRS using Allen Bradley ControlLogix PLCs and integrated Cognex and SICK scanners with Studio 5000.

North Carolina State University, Raleigh, NC—Graduate Research Assistant, ADAC Lab Feb 2021 – Dec 2021

- Collaborated with the U.S Department of Energy (DOE) to build an instrumentation system, using LabVIEW, for a high temperature integrated non-invasive ultrasound sensor (HiTEIS) for wireless monitoring of nuclear reactor and fuel cycle systems.
- Modeled a microgrid facility using Simulink and performed HIL simulation for the Collaborative Distributed Energy Management System (CoDEMS) algorithm using Raspberry Pi, working in collaboration with the NC Electric Membership Corporation.

EDUCATION

North Carolina State University, Raleigh, NC - MS Electrical Engineering Dec 2022

Savitribai Phule Pune University, Pune, India - BE Instrumentation and Control Engineering May 2018

SKILLS

- Programming languages: Python, MATLAB, Structured Text, PowerShell, Ladder Logic, VBA, SQL
- Controls Software: Beckhoff TwinCAT, Rockwell Studio 5000, Omron CX Programmer, MATLAB, SIMULINK, LabVIEW, ePLAN EEC
- SCADA Systems: Wonderware InTouch, Ignition
- Industrial Networks: Ethernet/IP, Profibus, Profinet, MQTT, OPC UA

PROJECTS

Digital Twin Modeling and Control Validation for Drilling Systems Feb 2024 – Dec 2024

- Developing a digital twin of the Topdrive and Drawworks drilling systems using MATLAB/Simulink and Simscape to test, validate, and optimize drilling software.
- Generating Beckhoff PLC control logic in Structured Text from the Simscape model and implementing hardware-in-the-loop (HIL) testing to validate and refine the PLC control logic ensuring safety, reliability, and accuracy in real-time drilling operations

Vision Based Lane Detection and Autonomous Navigation with NVIDIA JetBot Aug 2022 – Nov 2022

- Created a perception-aware self-driving strategy using ResNet-18 CNN trained on images to drive around a track. Compared controller performance based on stability, control effect, and robustness.
- Modeled system dynamics and designed a digital PID controller with pidTuner to meet the closed-loop system parameters.

Lyapunov-based Non-Linear Tracking Control of a 2-link Robotic Manipulator Aug 2021 – Oct 2021

- Devised model-based non-linear control design for a 2-link robot using Simulink and simulated Exact Model Knowledge (EMK), **Adaptive** and **Robust (Sliding-Mode) Non-Linear controllers** to track a desired trajectory of the robot.
- Compared and evaluated the performance of these 3 controllers based on their stability, control effect, and robustness.

Terrain Classification from Time Series Data Jan 2021 – May 2021

- Classified different terrains from IMU sensor (accelerometer and gyroscope) data by testing Conv1d, SimpleRNN, LSTM, GRU and dense layers in Keras, achieving an accuracy of **85%** for the best **RNN LSTM** model.
- Preprocessed the data by down-sampling and creating custom time windows.