Nathan Corral

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As a Computer Engineer with a master's specialization in Intelligent Systems and experience in Robotics, I am excited to apply for the Software Engineer position in Professional Outdoor Service Robots at Fraunhofer.

Job Experience

Humanoid Robots Lab – University of Bonn 09.2021 – 09.2022
Research Assistant Bonn, Germany

- Contributed to research and publications in personalized robot navigation.
- Programmed the ROS interface for 3D localization of humans from an RGBD camera using deep learning and implemented this on a real robot for autonomous navigation.
- Used the photo-realistic simulator iGibson (PyBullet backend) to generate data for a deep reinforcement learning-based path planning algorithm.
- Conducted a user study evaluating human-robot-interaction in a VR headset, with a follow-up on real robot hardware.

Head Rush Technologies 12.2019 – 04.2020
Contract Engineer Boulder, USA

- Contracted to code the firmware on a ATmega328PB Microchip for a proof-of-concept system.
- Completed field tests and project documentation.

Aqronos 11.2018 – 12.2019
Software Engineer Denver, USA

- Structured UDP packets and coded both ends of sending and receiving modules.
- Interacted with a REST API to set parameters on an embedded system.

Education

Rheinische Friedrich-Wilhelms-Universität Bonn 10.2020 – 09.2023
M.Sc. *Computer Science* Note: 1.7
Thesis: ***Stochastic Transformer for Prediction of Multiple Futures***

- Developed a novel transformer-based predictor architecture, able to learn a distribution over potential futures.

University of Illinois Urbana-Champaign 08.2013 – 05.2017
B.Sc. *Computer Engineering* GPA: 3.55/4.0

Projects

ROS 2 Whisper 2024
Maintainer Video, Source

- Extended this open source project to support boarder-less, live transcription.
- Implemented the C++ code to place special attention on code efficiency and scalability.

Projects (continued)

ROS 2 Computer Vision 2024
Author Video, Source

- Designed a ROS 2 pipeline to run multiple Computer Vision (CV) tasks (Object Detection, Per-Pixel Segmentation) in parallel.
- Run the pipeline on both live camera feed and a dataset, which allowed time comparisons between the asynchronous running of multiple models.

Publications

J. de Heuvel, **N. Corral**, et al. "Learning depth vision-based personalized robot navigation from dynamic demonstrations in virtual reality" *IROS*, 2023

Skills

Languages	· English (Native) · German (fluent, C1 self-assessed)
Strengths	· Problem Solving · Cross-Team Collaboration · Reliable · Technical Documentation · Hard Working
Coding	· C++ · Python · Bash · C · LaTeX
Software	· Linux/Ubuntu · GitHub · Docker · ROS/ROS 2 · Hyperstack · AWS EC2
Knowledge	· Agile · REST API · Continuous Integration · POSIX · Machine Learning · Data Structures · Deep Learning Architectures
Robotics	· Forward/Inverse Kinematics · SLAM · Path Planning · PID / Model Predictive Controllers · Kalman (Bayes) Filters
Simulators	· CARLA · iGibson · (Py)Bullet · Gazebo · Webots

Signature: 
Date: December 4, 2024
Place: Bonn, DE