



Nathan Corral

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👤 [NathanCorral](#)

As a Computer Engineer with a master's specialization in AI and a few years experience as a Software Engineer, I am eager to advance applied automation through state-of-the-art deep learning solutions.

Job Experience

- 📌 **Humanoid Robots Lab – University of Bonn** *Research Assistant*
09.2021 – 09.2022 *Bonn, Germany*
 - Contributed to research and publications in personalized robot navigation.
 - Used the photo-realistic simulator iGibson (PyBullet backend) to generate data for a deep reinforcement learning-based path planning algorithm.
 - Setting up and conducting a user study evaluating human-robot-interaction in a VR headset, with a follow-up on real robot hardware.
- 📌 **Head Rush Technologies** *Contract Engineer*
12.2019 – 04.2020 *Boulder, USA*
 - Contract was to code the firmware on a ATmega328PB Microchip for a proof-of-concept system.
 - Completed field tests and project documentation.
 - Success from this prototype led to further development, ultimately released as their "Catch-and-Hold Technology".
- 📌 **Aqronos** *Software Engineer*
11.2018 – 12.2019 *Denver, USA*
 - Structured UDP packets and coded both ends of sending and receiving modules.
 - Interact with a REST API hosted on the embedded system for configuring hyperparameters.
 - Filtered point clouds and grouped objects using the C++ Point Cloud Library.

Education

- 📌 **M.Sc. University of Bonn** *Computer Science*
10.2020 – 09.2023 *Note: 1.7*
- 📌 **B.Sc. University of Illinois Urbana-Champaign** *Computer Engineering*
08.2013 – 05.2017 *GPA: 3.55/4.0*

Master Thesis

- 2023 📌 **Stochastic Transformer for Prediction of Multiple Futures**
- This thesis builds upon the foundations of Stochastic Video Generation¹ and Variational Transformers², expanding their applications into a versatile, task-agnostic, stochastic prediction network. This thesis contributed:
- A novel transformer-based predictor architecture, able to learn a distribution over potential futures.
 - Detailed comparison against other stochastic-based models in video prediction, boasting higher structural similarity in frame-wise comparisons.

¹Denton et al., "Stochastic video generation with a learned prior." ICML 2018

²Lin et al., "Variational transformers for diverse response generation." arXiv 2020

Projects

2024

📖 ROS 2 Whisper

[Video](#), [Source](#)

As an extension of this open source project, I implemented boarder-less, live audio transcription. My contribution has led to me being an active maintainer in this project. Written in C++, the code emphasizes:

- Scalability, using both inheritance and composition in object-oriented programming behavior.
- Efficiency, through intentional memory management, thread-safe callbacks and work splitting across multiple nodes.
- Simplicity, in the well thought-out implementation of complex merging algorithms.

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 (C1)
Strengths	📖	• Problem Solving	• Cross-Team Collaboration
		• Technical Documentation	• Hard Working
Coding	📖	• C++	• Python
Software	📖	• Bash	• C
		• LaTeX	• Java
		• Go	
		• Linux/Ubuntu	• GitHub
		• Docker	• ROS/ROS2
		• QEMU	
		• Hyperstack	• AWS EC2
Knowledge	📖	• Agile	• REST API
		• Test-driven Development	• POSIX
		• Object Oriented Programming	• Data Structures
		• .NET	