Emanuel André Medina Araujo

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Education

Technical University of Munich Oct. 2020 – Apr. 2026
Bachelor of Science in Computer Science, Application Area in Physics *Munich, DE*

Herzog-Christoph-Gymnasium Sep. 2012 – Sep. 2020
Abitur, Awarded MINT-EC certificate with distinction *Beilstein, DE*

Experience

Working Student Software Engineer Nov. 2024 – Present
Vector Informatik GmbH - VSceneCreator (3D OPENDrive Editor) *Munich, DE*

- Helped ship the 0.1 alpha version of the VSceneCreator (Unity/C#) by suggesting, designing and implementing features, addressing bugs, and creating tests through close collaboration with Product Management.
- Architected a read-only "Explore Mode" with a hierarchical overview tree and dynamic tooltip system, segregating access to editing features resulting in a preview tool for licensed users and an improved UX for free users.
- Improved edit mode switching performance by restructuring the base model to enable lazy loading for non-essential and non-visible objects resulting in up to 70% faster switch times.
- Implemented support for single-sided lanes, enabling users to load OPENDrive files with single-sided lanes by automatically converting them to normal lanes resulting in prevention of broken files.

Working Student Software Engineer Mar. 2021 – Oct. 2024
Vector Informatik GmbH - DYNA4 (Simulation environment for virtual driving tests) *Munich, DE*

- Developed features, fixed critical bugs, and enhanced UI using Java and Eclipse RCP, contributing to 5 major product releases (5.0 to 9.0) in direct collaboration with the Product Management.
- Engineered a custom view to assign aliases for trace signals with a new file format, a custom persistence layer and reducing expected user knowledge with errors and warnings via built-in validation and quickfixes.
- Enhanced usability by completely reworking the trace signal view, leading to a more modern and efficient UX.
- Reduced manual QA effort and accelerated development cycles by expanding automated test suites using SWTBot and JUnit in addition to enhancing the CI pipeline to link Jenkins results with JIRA tickets.

Projects

ClarissaApp | *Privacy-first personal health mobile app* Aug. 2025 – Present

- Built a privacy-first mobile app for menstrual cycle tracking with React Native (Expo) and TypeScript.
- Implemented calendar-based cycle logging with symptom tracking and three themes (dark/light/red).
- Engineered offline-first storage with expo-sqlite, modular components/hooks, and a clear UX for fast daily logging.

Learning Based Inverse Kinematics | *Bachelor Thesis* Jun. 2024 – Nov. 2024

- Designed and implemented learning-based IK solvers for 2- and 3-DOF manipulators in Python and Pytorch, comparing direct-angle regression with probabilistic outputs across MLP, LSTM, hybrid MLP+LSTM, and PPO.
- Built a synthetic data generation and evaluation pipeline; ran controlled experiments on a 10k-sample test set to quantify accuracy, convergence, and runtime across architectures and output parameterizations.
- Found that a simple MLP with direct-angle prediction consistently outperformed more complex models, highlighting a non-trivial complexity-performance trade-off and yielding clear guidance for practical IK model selection.

Ironman | *2.8km swim, 180km bike, 42.2km run; Overall Time : 14:21:26h* Oct. 2022 – Aug. 2024

- Completed full Ironman triathlon through disciplined training and a goal-oriented race plan, demonstrating resilience and on-the-fly problem-solving under fatigue and variable race conditions to reach the finish.

Humanoid-controlled robot arm | *Student Engineering Academy* Sep. 2018 – Jul. 2019

- Programmed a self-built robot arm controlled via a humanoid interface.
- Developed a virtual movement visualization of the arm sleeve with flex sensors in Blender with Python.
- Programmed Arduino microcontroller in C/C++ to read movement data from the arm sleeve, transmit them wirelessly via radio using the SPI protocol to the robot arm and map them to the servo motors.

Technical Skills

Languages: C#, Java, C/C++, Python, React, JavaScript, MATLAB
Developer Tools: Git, Rider, VS Code, Unity, VIM Motions, Eclipse, Linux, PyCharm, Jenkins, GitHub, Jira