

# Emanuel André Medina Araujo

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## EDUCATION

### Technical University of Munich

*Bachelor of Science in Computer Science, Application Area in Physics*

Munich, DE

Oct. 2020 – Apr. 2026

### Herzog-Christoph-Gymnasium

*Abitur, Received MINT-EC certificate with distinction*

Beilstein, DE

Sep. 2012 – Sep. 2020

## EXPERIENCE

### Working Student Software Engineer

*Vector Informatik GmbH - VSceneCreator (3D OPENDrive Editor)*

Nov. 2024 – Present

Munich, DE

- Collaborated to develop the 0.1 alpha version of VSceneCreator as an Unity application in C#. Suggested, designed, implemented and wrote tests for core features and bugfixes in 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.
- Optimized file loading through batched object creation and an enhanced progress bar replacing application freezes resulting in 10% faster loading times, reduced memory usage and a better UX.
- 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.
- Streamlined developer tools by integrating Unity with Rider resulting in 10% faster compile and refresh times.

### Working Student Software Developer

*Vector Informatik GmbH - DYNA4 (Simulation environment for virtual driving tests)*

Mar. 2021 – Oct. 2024

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.
- Improved user workflow and simulation project integrity by developing a utility dialog to find and remove unreferenced files and by refactoring a dialog to transparently display all unsaved artifacts.
- 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.
- Improved codebase maintainability and enabled faster subsequent development by refactorings of legacy systems.

## PROJECTS

### ClarissaApp | Privacy-first personal health mobile app

Aug. 2024 - Present

- Built a privacy-first mobile app with React Native (Expo) and TypeScript for menstrual cycle tracking.
- 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.

### Full-Stack ISP Comparison | Check24 Scholarship Challenge

May 2025 – Jun. 2025

- Implemented a modular full-stack (React + Vite + Tailwind frontend, Node.js/Express backend).
- Integrated timeout/health handling and an ISP provider normalization layer to produce consistent comparisons.
- Developed a share results feature with via a TinyURL export persisting the results within the link.

### ClarissaApp | Privacy-first personal health mobile app

Aug. 2024 - Present

- Built a privacy-first mobile app with React Native (Expo) and TypeScript for menstrual cycle tracking and pill reminders using local encrypted storage.
- Implemented core features: calendar-based cycle logging with symptom tracking, customizable local notifications for pill reminders, and theme support (dark/light/red).
- Engineered for usability and security: 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
- TODO Investigated and implemented learning-based approaches to inverse kinematics, focusing on improving the efficiency and accuracy of robotic arm movements.
- Ilab2** | *Advanced Practical Course* TODO
- TODO
- Cyber-Physical Seminar** | *Advanced Seminar Course* TODO
- TODO
- ERA Practical Course** | *Advanced Practical Course* TODO
- TODO
- Ironman** | *3.8km 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.
- FreshFinder** | *hackaTUM - HelloFresh Challenge* Nov. 2023
- Developed a React + TypeScript web app for collaborative, parallel cooking sessions with a team of 4
  - Designed a recipe dependency-graph architecture for task distribution using Supabase Realtime.
  - Integrated the OpenAI API to dynamically adapt recipes for individual preferences and amounts.
- StreamFindA** | *hackaTUM - Burda Challenge* Nov. 2022
- Built a React front end with a Django/Python backend for swipe-based movie/series recommendations.
  - Implemented a recommendation algorithm based on pairwise choices using dwell time and negative feedback.
  - Parsed and normalized the provided multi-platform catalog to a usable format to power reliable recommendations.
- 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.
- MATLAB physics visualizations** | *International Summer Physics Institute, University of Notre Dame* Jul. 2018
- Completed Cosmic Ray Detection team project by building a detector plus analyzing and visualizing the data.
  - Visualized and analyzed CERN CMS particle-physics data using MATLAB.
- Hydrogen fuel cell prototype** | *9th Trinational Student Congress, Strasbourg* Jan. 2017
- Developed a hydrogen fuel cell concept and demonstrator with a friend and presented it in the congress.

## FURTHER HIGHSCHOOL EXPERIENCE

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- STEM Programs and Workshops** 2017 – 2019
- MINT-EC Workshop: Masterclass Particle Physics (Jun. 2019).
  - Fraunhofer Talent Take Off – Vernetzen (2019).
  - Regional MINT-Camp “Life on Mars” (May–Jun. 2019): Developed concepts for life-essential resources.
  - Tag der Kombinatorik — group-based local math contest (Feb. 2019).
  - Student Engineer Academy — project track (2018–2019).
  - Fraunhofer Talent School (Mar. 2018): Implemented an image classifier (cats vs. dogs).
  - Student Engineer Academy — Programming in C (2017–2018).
- Early student Internships** 2015 – 2019
- Bosch, Stuttgart-Feuerbach — voluntary engineering internship (Apr., 2019).
  - Palfinger, Ilsfeld — voluntary mechanic internship (Sep. – Oct., 2017).
  - Getrag, Untergruppenbach — voluntary mechanic internship (Sep., 2017).
  - Vector, Stuttgart — “Mitmachen Ehrensache” social one-day placement (Dec., 2015).
  - Eberhard Schweizer Grundschule Ganztagesgruppe — social week-long placement in nursery school (Nov., 2015).
- Music and Community** 2009 – 2020
- Leadership: Youth spokesman, Heinriet Sports Club (2016–2020); school mediator for grades 5–6 (2016–2020).
  - Awards: D2 (2017, excellent–very good); Jugend musiziert 2nd prize (2015); D1 (2014, very good); scholarship (2013) and gifted promotion (2012) in trombone.
  - Piano and trombone (advanced); District youth orchestra Heilbronn (2017–2020); Musikverein Heinriet (2014–2020); school band 1st trombone (2012–2014).
  - Theater: Castle theater productions as trombonist and actor (2017: Das kleine Gespenst; 2016: Some like it hot).

## TECHNICAL SKILLS

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**Languages:** C#, Java, C/C++, Python, React, React Native, MATLAB

**Developer Tools:** Git, Rider, VS Code, Unity, VIM Motions, Eclipse, PyCharm, Jenkins, GitHub

**Relevant Course Work:** Experimental Physics 1, Physics Lab Course, Innovative Entrepreneurs - Leadership of High-Tech Companies, Principles of Economics, Concepts of C++ Programming, Parallel Programming, Data Structure Engineering, Discrete Probability Theory, Laboratory: Computer Organization and Computer Architecture, Functional Programming and Verification, Introduction to Theory of Computation, Advanced Seminar Course Cyber-Physical Systems, Advanced Practical Course Internet Lab - ilab2