Michael Roman Gnadlinger

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Hypersonics · Research · Automation

EDUCATION

10/2023 – present **M.Sc. Aerospace — Technical University of Munich**
Provisional GPA 3.4/4.0 (1.9 German scale)

10/2020 – 10/2023 **B.Sc. Mechanical Engineering — Technical University of Munich**
GPA 3.4/4.0 (1.9 German scale, top 11.6%) — Completed in 6 semesters (University avg. 8.1)

09/2014 – 06/2019 **Technical Highschool for Mechatronics**
GPA 3.9/4.0 (1.12 Austrian scale) — Graduated with Distinction "Best Upper Austria"

EXPERIENCE

09/2025 – present **Aerodynamic Intern — Hypersonica**
European Hypersonic Defence Startup
Owned control fin design end-to-end — developed an intuition for how geometry drives aerodynamic behavior at hypersonic speeds, then applied first principles and deliberate reasoning through targeted parameter studies to converge on an optimized design. Built automated aerodatabase generation toolchains around low-fidelity tools. Wrote custom C-code for aero-thermal coupling, meshed complex vehicle geometries, and validated CFD setups against literature-sourced experimental data.

05/2024 – 11/2024 **Visiting Research Scholar — University of Michigan**
Barton Research Group
Independent research on Digital Twin standardization and sharing across industrial value chains. First-authored the resulting IEEE CASE conference paper from research-gap identification to submission — awarded as a finalist for the Best Application Paper.

10/2021 – 07/2025 **Research Assistant — Technical University of Munich**
Institute of Automation and Information Systems
Research at the intersection of software engineering and industrial production systems. Investigated quality patterns and evolution of industrial PLC control software — translating empirical findings and identified patterns into publishable scientific frameworks. Co-authored two peer-reviewed IEEE publications and contributed to a book chapter. Served as a direct consultant to industrial partners, introducing research-backed tools and methodologies.

05/2024 – 11/2024 **Engineer — MASA (Student Rocketry Team at UofM)**
Built a MATLAB GUI for multi-regime rocket fin load analysis — subsonic, transonic, and supersonic aerodynamic loads across full flight profiles. Based on analytical methods from Bonney, Liu, Stanford AA200b, and NASA technical reports.

11/2023 – 09/2025 **Engineer — WARR (Student Rocketry Team at TUM)**
Type 5 carbon fiber pressure vessel development. Owned high-pressure burst testing pipeline end-to-end. Designed automated sealant distribution system. Contributed systems engineering via SysML interface and requirements modeling.

2016 – 2018 **Pre-University Science & Engineering Programs**
Selected during highschool for competitive gifted-student programs hosted at Johannes Kepler University — Invent a Chip workshop, JKU Young Scientists engineering track, and twice Applied Mathematics Project Week (focus on fluid dynamics).

SELECTED PUBLICATIONS

M. Gnadlinger, D. M. Tilbury, K. Barton, J. Wilch, B. Vogel-Heuser, *"Requirement-driven Sharing of Manufacturing Digital Twins Along the Value Chain,"* IEEE CASE 2025. **Best Application Paper Finalist.** doi: 10.1109/CASE58245.2025.11164130

E. M. Neumann, B. Vogel-Heuser, **M. Gnadlinger**, et al., *"Metric-based Identification of Target Conflicts in the Development of Industrial Automation Software Libraries,"* IEEE IEEM 2022. doi: 10.1109/IEEM55944.2022.9989691

Y. Wang, B. Vogel-Heuser, E. M. Neumann, **M. Gnadlinger**, et al., *"Change Categories Based on Mutable Artifacts in PLC Control Software Projects,"* IEEE ICPS 2024. doi: 10.1109/ICPS59941.2024.10639988

SKILLS & TOOLS

CFD	High-Fidelity: OpenFOAM, Ansys Fluent, Ansys CFX · Low-Fidelity: DATCOM, RocketPy · Meshing: ANSA, snappyHexMesh
Programming	Python, MATLAB (incl. Simscape, Simulink, Stateflow), C/C++, VBA, LabVIEW
CAD & FEM	SolidWorks (incl. FEM), Siemens NX, CATIA, Inventor, Altair FEM
Embedded	ESP8266, ESP32, Arduino, Raspberry Pi, UART, SPI, UDP, TCP, MQTT, PCB Design and Soldering
Automation	PLC Programming, Industrial Automation, EPlan, Process Control
Languages	German (native), English (fluent)