

# David Aba Zid

## Aerospace Engineering

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## EDUCATION

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**Master of Science in Aerospace Engineering** 2025  
Technical University of Brunswick

**Bachelor of Science in Mechanical Engineering** 2012  
Osnabrück University of Applied Sciences

## WORK EXPERIENCE

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**Master Student, DLR (German Aerospace Center)** *Present*  
As a Master's student at DLR, I contribute to the **safety and reliability analysis of high-altitude platform (HAP)** systems, particularly focusing on critical operational phases such as take-off, cruise flight, and landing. The work is conducted using **Python** and **MATLAB** for modeling and simulation, **Microsoft Office** for reporting, and **LaTeX** for formal documentation. My key responsibilities include:

- **Modeling Crash Scenarios:** Developing simulation models to analyze crash scenarios under various failure conditions, such as power loss, structural failure, and navigation system errors.
- **Risk Assessment:** Calculating the likelihood of a HAP system impacting inhabited areas during a crash, considering flight paths and stochastic variables such as aerodynamics and wind conditions.
- **Flight Path Simulation:** Defining nominal flight trajectories and discretizing them for precise crash scenario modeling and prediction.
- **Ground Impact Analysis:** Classifying ground impact areas into categories (e.g., uninhabited, sparsely populated, or densely populated) to estimate potential risks to people and property.
- **Application of Probabilistic Methods:** Utilizing advanced probabilistic methods to incorporate uncertainties in aerodynamics, weather conditions, and system failures.
- **Standards Integration:** Applying the **SORA** (Specific Operations Risk Assessment) methodology to ensure a structured and recognized framework for evaluating operational risks and safety requirements throughout the simulation process.
- **Visualizing Simulation Results:** Creating maps and visual representations of crash probabilities and potential impact zones to effectively communicate findings.
- **Interdisciplinary Collaboration:** Collaborating with experts in aerodynamics, system design, and risk analysis to enhance simulation robustness and ensure comprehensive evaluations. This work includes direct interaction with the **German Federal Aviation Office (Luftfahrt-Bundesamt)** regarding certification topics, where the developed simulations have been officially accepted as part of the certification process.
- **System Reliability Analysis:** Evaluating the required reliability levels for future HAP developments by analyzing system failure probabilities and maintenance strategies.

**Scientific Assistant, Technical University of Brunswick** 2022-2025  
Over the course of several semesters, I worked on a wide range of tasks, each tailored to different technical areas to intentionally broaden my practical and academic experience. Key responsibilities included:

- Structural design and modeling
- Performing finite element method (FEM) calculations for structural analysis
- Coordinating project workflows and tracking progress
- Conducting academic research and analyzing engineering data

- Tutoring and lecture support in:
  - Mechanics I–III
  - Mathematics for Engineers
  - CAD using CATIA V5

### **Product Manager, Brunel GmbH**

2020–2022

Collaborated with Volkswagen on multiple vehicle development projects, including the Multivan T7 and other models such as the Golf Mk8, Tiguan, Passat, and ID.4. Responsibilities encompassed:

- Coordinating cross-functional teams to ensure timely project delivery
- Managing product development cycles from concept to production
- Facilitating communication between engineering, design, and manufacturing departments
- Overseeing quality assurance and compliance with industry standards

### **Product Manager, Federal Office of Bundeswehr Equipment (BAAINBw)**

2019–2020

Held a pivotal role in project management and SAP system administration. Key responsibilities included:

- Providing strategic consulting for project planning and execution
- Designing and optimizing process workflows to improve efficiency
- Administering SAP systems for operational support and data management
- Supporting the implementation and continuous improvement of SAP processes
- Participated in certified training programs offered by the Bundeswehr, covering logistics, SAP systems, organizational management, infrastructure, administrative law, and weapons systems:
  - F/STSE/MATERH – Fundamentals of material handling (BAAINBw, Wilhelmshaven)
  - F/GK-Äußere Organisation – Organization of external structures (Ref LehrBer Berlin)
  - F/GK-Innere Organisation – Organization of internal structures (Ref LehrBer Oberammergau)
  - HS122 SASPF LOGISTIK – SAP logistics for project and production management (LogSBw XII. In)
  - HS122 SASPF INFOMGMT/LOGPROJ – SAP logistics and project management integration (LogSBw XII. In)
  - F/HG/MAN/S-GLPME/INFRU – Fundamentals of equipment management and infrastructure (BIZBw Mannheim)
  - FACHMODUL BED.NUTZUNGSSTEUERUNG – Resource and usage control (BIZBw Mannheim)
  - F/STSEM/WAFFANL I – Basic training in weapons systems (BIZBw Mannheim)
  - INTENSIVKURS VERWALTUNGSRECHT – Intensive course in administrative law (Ref Oberammergau)
  - REWE-SASPF KRED/DEB – SAP accounting: credit and debit (BIZBw Mannheim)
  - HS121 GRDL MOD CPM (NOV.) – Basic training in CPM (Critical Path Method) (LogSBw XII. In)

### **Project Manager, United Arab Emirates Navy**

2017–2019

Led the planning and execution of complex system integration projects for naval platforms. Responsibilities included:

- Coordinating testing and evaluation phases for various defense systems
- Overseeing ship reconstruction processes to prepare for system installation
- Managing the engineering and development of shipboard systems
- Conducting both static and dynamic maneuver tests to ensure operational readiness

- Repeating this cycle for additional systems intended for naval and land-based applications

## **Mechanical Engineer, Volkswagen AG**

2012–2016

Worked in the field of product design and development, with responsibilities including:

- Designing interior, exterior, and solid-surface components
- Creating and interpreting technical drawings and specifications
- Utilizing CAD software such as CATIA V5, SolidWorks, and Siemens NX
- Iteratively developing products from concept through to final production
- Managing product lifecycles and coordinating across design and engineering teams

## **PRACTICAL EXPERIENCE**

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### **Flying Summer School at German Aerospace Center (DLR)**

Summer 2023

**German Aerospace Center (DLR), Technical University of Brunswick and the German Aeronautical Universities**

Over a 10-day program focused on flight testing with the research aircraft Cessna 208B Grand Caravan (D-FDLR), we conducted comprehensive experiments to evaluate various aspects of aircraft performance. The tests included:

- Performing stall analysis and comparing stall speeds ( $V_S$ ,  $V_{IAS}$ ) with theoretical and empirical values; computing maximum lift coefficient  $C_{A,max}$ .
- Analyzing cruise performance from flight data using torque and true airspeed to determine propeller thrust and power output.
- Modeling short-period pitch oscillations using a state-space approach; extracting damping ratios and natural frequencies from elevator sweep responses.
- Evaluating longitudinal static and dynamic stability through phugoid motion and free response data; calculating neutral point location and key stability derivatives.
- Investigating Dutch roll behavior with and without yaw damper; quantifying damping using the transient peak ratio method.
- Extracting drag polars from in-flight measurements, considering center-of-gravity positions and weight-and-balance calculations.

These results provide valuable insights to improve the safety, efficiency, and aerodynamic performance of aircraft operations.

### **Flight Test Internship**

Summer 2022

**Institute of Flight Guidance, TU Brunswick**

The Flight Test Practical utilizes the research aircraft of the Institute of Flight Guidance at the Technical University of Braunschweig, a Reims **Cessna F 406** (registration D-ILAB). Students conduct and document four experiments, with in-flight data recorded and analyzed post-flight. The experiments include:

- **Measurement of Aileron Deflection:** Assessing roll control.
- **Investigation of Stall Characteristics:** Enhancing safety measures.
- **Behavior of a Magnetic Compass:** Ensuring accurate navigation.
- **Climbing Performance and Resistance Polars Evaluation:** Determining the aircraft's ascent capability and maintaining stable flight paths.

These experiments enhance students' understanding and expertise in measuring and analyzing technical flight data.

## **ACADEMIC PROJECTS**

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### **Cold Gas Thruster**

2024

**Institute of Space Systems (IRAS)**

Developed and tested a cold gas propulsion system for the ELISSA table platform. Responsibilities included:

- Designing thrust-generating nozzles and a custom test stand
- Manufacturing supersonic nozzles using SLA 3D printing
- Conducting thrust tests to validate nozzle performance
- Demonstrating the feasibility of cold gas thrusters for ELISSA Free-Flyer systems
- Presenting and discussing test results in academic and project team settings

### **Subsonic Wind Tunnel**

2022

#### **Institute for Fluid Mechanics (ISM)**

Worked on the redesign and modification of a smaller test section within the MUB subsonic wind tunnel at the Institute of Fluid Mechanics (ISM), TU Braunschweig. Key tasks included:

- Adapting the geometry and configuration of the test section for experimental requirements
- Supporting integration and alignment of new measurement systems
- Assisting with test planning and setup preparation for airflow investigations
- Documenting technical modifications and reporting results to the supervising research team

### **Siemens Smart Remote Services**

2021

#### **Siemens AG**

Contributed to the digitalization of remote services through structured project management. Responsibilities included:

- Utilizing **Enterprise Architect software** to model and optimize service architectures
- Supporting planning and coordination of remote service processes
- Assisting in the development of digital solutions for system diagnostics and support
- Ensuring alignment between technical documentation and project goals

## **COURSES**

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| • Simulation of Technical Systems with Python  | • Mechanic of Longitudinal and Lateral Movement |
| • Space Missions                               | • Space Technology Practice, Flight Guidance    |
| • Stability Theory in Lightweight Construction | • Project and Quality Management                |
| • Air Traffic Control                          | • Construction of Aircraft Structures           |
| • Air Traffic Safety                           | • Professional Skills                           |
| • Simulation of Technical Systems with Matlab  | • Numerics of Differential Equations            |
| • Air Traffic Management                       |   |

## **PROFESSIONAL SKILLS**

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- **Programming:** Python, Matlab, VBA
- **CAD:** CATIA V5, Siemens NX, Solidworks, PTC Creo
- **Management:** Project/Product Management, SAP/SASPF
- **Finance:** Standard application software product families (SAP/SASPF)
- **Other:** Microsoft Office, IT Security, PDM Systems

## LANGUAGES

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- **German:** Native
- **English:** Proficient

## TEACHING EXPERIENCE

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- **Technical Mechanic** 2020 – 2021  
Static Balance, Kinematics, and Dynamics Movement  
Technical University of Brunswick
- **CAD (Catia-V5)** 2016 – 2018  
Alfatraining Vocational Training Center
- **Mathematics for Engineers** 2010 – 2012  
Osnabrück University of Applied Sciences

## PUBLICATIONS

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**Conference** 2023  
**KI4ALL meets Future**  
Hackathon on Artificial Intelligence in Engineering, TU Brunswick

## PROFESSIONAL MEMBERSHIPS

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**German Society for Aeronautics and Astronautics (DGLR)**  
[www.dglr.de](http://www.dglr.de)

## VOLUNTARY WORK

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**Design and Development** 2022–2023  
**Rocket Propulsion (ERIG)**  
European Research Institute for Gas and Energy Innovation (ERIG a.i.s.b.l.)

## REFERENCES

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**Frég.Kpt. Tino Vogelmann**  
Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAINBw S1.4). +49 4424 26182

**Dr. Carmen Witte**  
Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw S1.4). +49 4424 26140

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