LEONARD
GÜNZEL

PERSONAL INFO

Place of birth
11.11.1997 / Potsdam

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Nationality
German

EDUCATION

PhD Candidate | **NTNU**
SINCE 09/2024

I began my PhD under the supervision of Professor Dr. Martin Ludvigsen in the Department of Marine Technology at NTNU. My research, conducted within the SAFEGUARD project, focuses on autonomous underwater perception and the abstraction of acquired data to enhance situational awareness in underwater robotic systems.

Master thesis | **NTNU**
09/2023 - 06/2024

My Master's thesis explored the potential of hyperspectral imaging to enhance under-ice navigation, earning the highest possible grade (1.0 / A). The research involved three Arctic expeditions to the Svalbard archipelago, fully funded by the Norwegian Research Council. This work will be presented at the Underwater Technology Conference 2025 in Taiwan and published as a conference paper.

Exchange Semester | **University of Tasmania**
09/2022 – 5/2023

From November 2022 to May 2023, I participated in an exchange semester at the University of Tasmania, specifically with the Institute for Marine and Antarctic Science (IMAS) affiliated with UTAS. During this period, I worked on a computer vision machine learning model, designed to detect algae in underwater imagery. The publication is under review.

Master of Science | **University of Bremen**
10/2021 - 06/2024

I have obtained my Master of Science in Electrical Engineering and Communication Technology at the University of Bremen with a mark of very good 1.38 (A) . My primary focus within this program was on Sensors and Electronics.

Bachelor of Science | **University of Applied Sciences Bremerhaven**
9/2017 – 6/2021

I completed my Bachelor of Science in Maritime Technologies from the University of Applied Sciences Bremerhaven between September 2017 and June 2021. With a commendable score of 85/100 (Grade B), ranking me in the top 10% of my class.

Exchange Semester | **EAFIT**

06/2019 – 12/2019

I undertook an exchange semester at EAFIT, one of Colombia's top universities, from June to December 2019. During this tenure, I delved into courses focusing on IT and manufacturing processes.

SCHOLARSHIPS

Arctic Field Grant

03/2025 - ONGOING

Successfully secured funding from the Norwegian Research Council for my independent research proposal GlacioMAR to survey the front of marine terminating glacier fronts on the arctic peninsula of Svalbard, advancing our understanding of ice-ocean interactions in polar environments.

Exposé Scholarship

06/2024 - 09/2024

Awarded a prestigious scholarship to support my transition from completing my Master's degree to starting my PhD. This funding enabled me to visit three leading marine institutes across Europe and establish connections with key researchers in my field on an international level.

Arctic Field Grant

01/2024 - 05/2024

I successfully submitted a research proposal to study Arctic ice structures to the Norwegian Research Council and received full financial support for my project. This funding will enable me to carry out three consecutive expeditions using my self-designed underwater robot.

German Academic Scholarship Foundation

10/2021 - 6/2024

I was awarded a scholarship by the German Academic Scholarship Foundation, the largest and oldest sponsorship organization in Germany. This distinction was in recognition of my academic excellence, placing me in the top 10% of my class, and my notable scientific achievements, which include two publications and several conference presentations. Additionally, my social engagement, exemplified by organizing scientific knowledge-sharing events and spearheading social events at my university, further underscored my qualifications for this award.

MatKat Scholarship Foundation

10/2021 – 4/2022

Following a project I collaborated on as an undergraduate, our team presented our findings at a notable conference. Our work garnered significant attention, leading to an invitation to publish our research. Recognizing the potential and importance of our study, I was awarded a scholarship specifically to facilitate the publication process. This support not only acknowledged the value of our initial research but also underscored the broader impact our publication could have in the academic community.

PROMOS

06/2019 – 12/2019

I was honoured to receive a scholarship from the prestigious DAAD (German Academic Exchange Service) for my exchange semester in Medellín, Colombia. This award was a recognition of my consistent academic excellence. The DAAD chose to finance my venture, acknowledging not only my academic prowess but also appreciating the initiative I took in self-organizing and self-motivating this enriching exchange experience.

PROFESSIONAL EXPERIENCE

Software engineer | Norwegian University of Science & Technology (NTNU)
SINCE 09/2023 PARTTIME TRONDHEIM, NORWAY
In my current position, I focus on analyzing data from underwater hyperspectral imaging cameras. By employing advanced machine learning models, I enhance navigation and deepen our understanding of underwater environments. This combination of advanced imaging and machine learning techniques improves the accuracy and efficiency of underwater exploration and data interpretation.

Internship | Stockholm International Peace Research Institute (SIPRI)
08/2023 – 11/2023 FULLTIME STOCKHOLM, SWEDEN
During my internship in the Department of Governance of Artificial Intelligence, I explored the relationship between international peace and security in the context of AI. My involvement mainly centered around the technical domain, where I shared insights on AI applications. Working alongside a dedicated team, I contributed to ongoing conversations about AI governance in the context of global peace efforts.

Software engineer | Institute for Marine and Antarctic Studies (IMAS)
SINCE 05/2023 PARTTIME REMOTE
Following my internship I was employed to expand my work on the machine learning algorithm I had created during my internship. My main responsibilities included expanding the model to include additional classes, refining its performance, and writing a publication detailing our approach and results. In addition, I worked on implementing the model into an online tool that could be used by external users.

Internship | Institute for Marine and Antarctic Studies (IMAS)
11/2022 – 05/2022 FULLTIME HOBART, AUSTRALIA
During my semester abroad, I developed a Machine Learning algorithm to identify specific species and objects within a dataset of underwater images. This algorithm was subsequently integrated into an online annotation tool, streamlining the automatic labeling process for underwater imagery.

Scientific assistant | German Institute for Artificial Intelligence (DFKI)
10/2021 – 09/2022 PARTTIME BREMEN, GERMANY
I primarily focused on sonar image manipulation and pre-processing for training a Machine Learning algorithm. Subsequently, I worked on enhancing the existing Machine Learning model. Additionally, I managed the interaction between systems using ROS (Robot Operating System).

Scientific assistant | GEOMAR
10/2021 – 04/2022 PARTTIME KIEL, GERMANY
I led the initial conceptualization of an underwater sensor system for deep-sea biomonitoring using optical sensors. The design received positive evaluations from the institute's engineers and is slated for future implementation.

Scientific assistant | German-Aerospace-Institute (DLR)
03/2020 – 10/2021 PARTTIME BREMERHAVEN, GERMANY
At the institute specializing in maritime infrastructure research, I was part of the optical sensor division. My primary responsibility involved integrating cameras and various sensors into a cloud-based platform. Additionally, as part of my bachelor's project, I implemented a thermal camera on the SPOT legged robotic platform by Boston Dynamics. This work was presented at a conference and subsequently published.

Scientific assistant| Alfred-Wegener-Institute
03/2019 – 06/2019 PARTTIME BREMERHAVEN, GERMANY
I collaborated with the lead engineer to design and manufacture measuring sensors for the MOSAiC polar expedition, the world's largest of its kind. A primary focus was ensuring the sensors' resilience against extreme environmental conditions.

ENGAGEMENT

UNODA & SIPRI Seminar Responsible AI for Peace and Security
I successfully participated in a two-day workshop on "Responsible AI for Peace and Security" organized by the Stockholm International Peace Research Institute and the United Nations Office for Disarmament Affairs on 16 and 17 November 2023 in Malmö, Sweden.

Organisation NWV Ocean Chat
I have been instrumental in organizing the NWV Ocean Chat, an event that functions as an informal lecture and discussion evening, planning meeting and marine science get-together. During these evenings, a marine scientist presents a general lecture, followed by discussions, especially with a focus on young scientists from the German Northwest.

Member of the Electrical Engineering study program committee
As a member of the Electrical Engineering Studies Committee (StugA) at the University of Bremen, I was involved in representing student interests and organizing various events. In this context, I initiated international exchange events between students and organized ethical seminars.

VCDNP Course on The Spread of Nuclear Weapons
From February 23 to 25, 2022, I participated as a selected participant in the second course on nuclear non-proliferation of the Vienna Center for Non-Proliferation and Disarmament (VCDNP). The course, part of the EU Non-Proliferation and Disarmament Consortium (EUNPDC), was aimed specifically at IT and engineering students. Under the title "The Proliferation of Nuclear Weapons: History, Threats and Solutions", the three-day course provided comprehensive insights into the topics of nuclear non-proliferation and disarmament.

QUALIFICATION

- Language skills:
  - German (fluent)
  - English (fluent)
  - Spanish (fluent)
- Norwegian (intermediate)
- Additional Qualifications:
  - G20 crane operator
  - Professional CAD Experience
  - Boat Driver License Ocean/Inland
  - EU Drone license A1/A3
  - PADI Advanced Open Water Diving License

CONFERENCES & PUBLICATIONS

- L. Günzel, et. al “Using Underwater Hyperspectral Imaging to Increase Feature Detection and Improve Under-Ice Navigation“ (Under Review)
- L. Günzel, et. al “Harnessing the power of SQUIDLE+ to develop flexible machine learning models“ (Under Review)
- Presentation at UN – endorsed NWV Ocean Chat
- L. Günzel, et. al. "Robotic Infrared Vision: Enabling operation in fog and low-light environments", in *European Workshop on Maritime Systems Resilience and Security (MARESEC 2021)*, Bremerhaven, 2021.
- L. Günzel, "Prototyping of a tethered undersea kite to harvest energy from low velocity currents", in *Frontiers in Marine Science*, Bremerhaven, 2022
- Student Representative for the University of Applied Sciences Bremerhaven at the High-Tech Forum (the official advisory body of the Federal Government for the implementation of the High-Tech Strategy 2025)
- Presentation at ICYMARE conference 2020 and 2021
- Session host ICYMARE conference 2021
- Presentation at Maresec conference 2021
- Presentation at ICYMARE Online Session