Saurabh Band

Msc. Embedded systems

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PROFILE

PhD researcher in IoT reliability at the University of Bremen, specializing in fault detection and diagnosis for edge devices. Strong expertise in embedded systems, machine learning, and anomaly detection, with hands-on experience across both academic research and industry. Skilled in supervising students, leading projects, and delivering solutions in low-power wireless, edge computing, and software development.

ACHIEVEMENT

3rd Place, EWSN'24 Sustainability Competition – Designed power-efficient computation strategy under strict energy constraints (link).

PROGRAMMING LANGUAGES

- Python ●●●●●
- Micropython ●●●●●
- Arduino ●●●●○
- C/C++ ●●●○○
- Javascript ●●●○○
- React.js ●●○○○

EXPERIENCE / INTERNSHIP

Research Assistant
12/2021 - Present

Dept. of Sustainable Comm., University of Bremen

- Ph.D. research in the field of IoT reliability
- Designing a fault detection and diagnosis method for IoT edge devices
- Teaching IoT and Edge computing modules
- Supervision of Master's Thesis and Projects
- **Tasks:** data collection using IoT devices, feature extraction, anomaly detection, root-cause analysis
- **Tools:** ESP32, Python, Micropython, C++, ML/DL

Software Developer and Consultant
08/2021 - 11/2021

getCoding GmbH

- Developing software and consulting to meet customers requirements
- **Tasks:** conception of app, implementing face recognition model with ML, deploying the app with CI/CD pipeline, adapting the app for multiprocessing, developing a standalone app for windows in python
- **Tools:** Python, Tensorflow, Jupyter, Django, React.js, Javascript, GitLab

Student research assistant
10/2020 - 08/2021

ZeTeM, University of Bremen

- Developed an automated system to determine the fetus health using deep-learning models based on CTG signal
- **Tasks:** Pre-processing data, building functions to extract features, classification of data, character recognition using deep-learning model
- **Tools:** Python 3, Matlab, PyTorch, Jupyter, WEKA

Student research assistant
04/2020 - 08/2020

DST, Chemnitz University of Technology

- Successfully tested deep learning architectures (ResNet50, RAPiD) for public and custom datasets
- **Tasks:** Pre-processing datasets (CIFAR-10/100, custom), implementing deep-learning models, reducing features using Principal Component Analysis (PCA), data visualization
- **Tools:** PyTorch, Tensorflow2.0, Python3, Jupyter

Intern
08/2019 - 12/2019

Ttention Inc.

- Successfully developed web application and acquired knowledge about REST framework, MySQL, MVC framework
- **Tasks:** Designing and developing GUI of the application
- **Tools:** Django, Python3

EDUCATION

Embedded systems (Masters)
09/2018 - 07/2021

Chemnitz University of Technology

GPA: 2.0

Content: Computer Vision, Design of Heterogeneous Systems, Smart Sensors, Design of Software for Embedded Systems, Real-Time Systems, Software Platforms for Automotive Systems, Hardware-Software Co-design, Digital Signal Processing

SOFTWARE SKILLS

- ML Frameworks (PyTorch, Tensorflow, OpenCV) ●●●●●
- Data Processing (time-series, images, vectors) ●●●●●
- Wireless Communication (WiFli, LoRa Bluetooth) ●●●●○
- Version Control (Git, GitHub) ●●●●○
- Edge Computing Softwares (Edge-Impulse, tfLite, Arduino) ●●●●○
- IDEs (VSCode, Arduino, Thonny) ●●●●○
- Linux OS ●●●●○
- LaTeX ●●●●○
- REST framework (Django) ●●●○○

HARDWARE SKILLS

- Low-power sensor devices (ESP32, MSP430, STM32) ●●●●○
- Edge Computing Hardwares (Arduino, RaspberryPi) ●●●●○

SOFT SKILLS

- Mentorship & Student Supervision
- Public Speaking & Presentation
- Time Management & Organization
- Problem-Solving & Critical Thinking
- Cross-Cultural Collaboration

LANGUAGE SKILLS

Marathi	C2
Hindi	C1
English	C1
German	A2

REFERENCE

Prof. Dr. Anna Förster
(Comnets, University of Bremen)
anna.foerster@uni-bremen.de,
+49 421 218 -62383

Electronics & Telecommunication (Bachelors) 08/2015 - 05/2018

Mumbai University

GPA: 2.0
Content: Discrete Signal Processing, Microcontrollers and application, Digital Electronics, Data Compression and Encryption.

PROJECTS

Unsupervised Domain Adaptation for Object Detection - Master Thesis 11/2020 - 06/2021

Chemnitz University of Technology / Zentrum für Technomathematik: Computer Vision

- Improved the performance of the object detection architecture by 14% with domain adaptation methods
- **Tasks:** Adapted object detection network for synthetic fisheye images, implemented two domain adaptation methods, observed effect of augmentation for synthetic fisheye images
- **Tools:** PyTorch, Jupyter, SSH

Selecting Influential Examples for Active Learning - Research Project 11/2019 - 01/2020

Chemnitz University of Technology: Computer Vision

- Improved the performance of the model by 6% by selecting the most unique samples identified using the proposed methods
- **Tasks:** Pre-trained ResNet50 for feature extraction, KNN for labeling and classification using soft-voting, proposed 2 different methods to select the most important samples
- **Tools:** Tensorflow2.0 (Python 3)

Evaluation of Power Supply Strategies for an Op-amp during Signal Processing - Masters Project 05/2019 - 08/2019

Chemnitz University of Technology: Measurement and Sensor Technology

- Observed the effect of power supply fluctuation on Op-amp's output
- **Tasks:** Simulate effects of noisy power supply, implement the Op-amp circuit, and analyze the output using FFT
- **Tools:** Arduino-Uno, C++, Python, LT Spice

Currency Recognition and Conversion System - Bachelor Thesis 07/2017 - 02/2018

Mumbai University: Image Processing

- Developed a system to identify the currencies and their denomination with a GUI
- **Tools:** OpenCV (Python), PyQt

PUBLICATIONS

- S. Band, A. Foerster “Reliability Analysis of a Monitoring System for Extraterrestrial Habitats,” Proc. 20th Int. Conf. on Wireless and Mobile Computing, Networking and Communications (WiMob), Oct. 2024, pp. 331–338. doi:10.1109/WiMob61911.2024.10770488S.
- S. Band, A. Foerster. “(Poster) Navigating the Unknown: Anomaly Detection in Sensor Nodes Based on Event Traces,” Proc. 20th Int. Conf. on Distributed Computing in Smart Systems and the Internet of Things (DCOSS-IoT), Apr. 2024, pp. 756–758. doi:10.1109/DCOSS-IoT61029.2024.00115