

DIPENDRA SUBEDI

Robotics Engineer | Mechatronics Specialist

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EXPERIENCE

Mechatronics Specialist

Hokarob AS.

Aug. 2022–Ongoing Grimstad, Norway

- Development of IRBCAM: a robot simulation software.
- Development of parallel kinematic machines.

PhD Research Fellow

University of Agder

Feb. 2019–Jul. 2022 Grimstad, Norway

- Dynamic modeling of multi-link flexible manipulators.
- Flexible link deflection estimation using a high speed camera.
- Flexible link deflection estimation using a tip-mounted inertial sensor (IMU).
- Interfacing Leica laser tracker with real-time Linux kernel using EtherCAT.
- Intrinsic and extrinsic calibration of camera and LiDAR.
- Camera-LiDAR data fusion for autonomous mooring operation using deep learning.
- Design and commissioning of a three-link flexible arm in the motion lab at the University of Agder.
- Static deflection compensation and oscillation damping control of flexible link manipulators.

Student Assistant

University of Agder

Feb. 2019–Jul. 2022 Grimstad, Norway

- Industrial IT and Robotics (Undergraduate Courses).
- Leading practical/lab and project sessions.
- Student supervision.

Robotics Software Engineer

Dorabot Inc.

Oct. 2017–Nov. 2018 Shenzhen, China

- Integration of vision, manipulation and sensor modules in warehouse sorting project.
- Development of drivers for controlling different manipulators (Yaskawa, Fanuc, and Kawasaki).
- Automatic calibration of cameras, force-torque sensor, robot and obstacles with high precision.
- Development of generalized motion planning library for different manipulators.

EDUCATION

PhD in Engineering Sciences, Specialization in Mechatronics

University of Agder

Feb. 2019–Jul. 2022 Norway

Thesis title: Modeling and Control of Flexible Link Manipulators

University Master's Degree Erasmus Mundus in Advanced Robotics

Jaume I University

Aug. 2016–Jul. 2017 Spain

Second year of Joint Master Degree, 90.9%.

Master of Science in Robotics Engineering

University of Genoa

Sep. 2015–Jul. 2016 Italy

First year of Joint Master Degree, 93.23%.

Bachelor of Engineering in Electrical and Electronics Engineering

PSNA College of Engineering and Technology, Anna University

Jul. 2010–Apr. 2014 India

University rank holder (5th rank among 1367 candidates graduated in 2014), 90.8%

SKILLS

C C++ Python JavaScript
Matlab/Simulink PLC Programming
Structured Text Maple ROS MoveIt!
Git TwinCAT OpenCV

Hard-working Elegant team player
Motivator & Leader Quick learner

PROJECTS

Amazon Robotics Challenge 2017

Jaume I University

📅 Feb. 2017–Jul. 2017

📍 Spain

- Developed a motion planning system to efficiently generate and execute trajectories for retrieving objects from a bin.
- Integrated force data to ensure a reliable extraction process, and navigating around obstacles.

Single-Phase Multilevel Inverter for Photovoltaic Systems

PSNA College of Engineering and Technology

📅 Feb. 2013–Apr. 2014

📍 India

- Designed and evaluated a novel single-phase multilevel inverter in Matlab and implemented the same in hardware as a part of undergraduate thesis work.
- Used Xilinx Spartan-3A DSP FPGA for implementing a digital PI current control algorithm and for generating gating signals for the inverter.
- Implemented maximum power point tracking algorithm.

PUBLICATIONS

📄 Patents

- Y. Xu, D. Zhou, N. Nechyporenko, **D. Subedi**, I. Vasilev, and S. Ma, “Caching Apparatus, Goods-Sorting Apparatus, and Goods-Sorting System,” WO Patent 2019218271, Nov. 21, 2019.
- H. Zhang, S. Ma, **D. Subedi**, I. Vasilev, and D. Zhou, “Robot System, Automatic Calibration Method, and Storage Device,” WO Patent 2019237223, Dec. 19, 2019.

📄 Journal Articles

- **D. Subedi**, T. N. Aune, I. Tyapin, and G. Hovland, “Static deflection compensation of multi-link flexible manipulators under gravity,” *IEEE Access*, vol. 10, pp. 9658–9667, 2022. DOI: 10.1109/ACCESS.2022.3144404.
- **D. Subedi**, I. Tyapin, and G. Hovland, “Dynamic modeling of planar multi-link flexible manipulators,” *Robotics*, vol. 10, no. 2, 2021, ISSN: 2218-6581. DOI: 10.3390/robotics10020070.
- A. Aalerud, J. Dybedal, and **D. Subedi**, “Reshaping field of view and resolution with segmented reflectors: Bridging the gap between rotating and solid-state lidars,” *Sensors*, vol. 20, no. 12, 2020, ISSN: 1424-8220. DOI: 10.3390/s20123388.
- **D. Subedi**, I. Tyapin, and G. Hovland, “Review on Modeling and Control of Flexible Link Manipulators,” *Modeling, Identification and Control*, vol. 41, no. 3, pp. 141–163, 2020. DOI: 10.4173/mic.2020.3.2.

👥 Conference Proceedings

- S. Wyckaert, J. F. Røsjordet, H. Bergstøl, *et al.*, “Calibration of a translational 3-dof parallel kinematic machine using full pose measurements and mechanical adjustments,” in *2023 11th International Conference on Control, Mechatronics and Automation (IC-CMA)*, 2023, pp. 369–374. DOI: 10.1109/IC-CMA59762.2023.10374825.

ACCOLADES



Best Presentation Award

at the 2020 IEEE 11th International Conference on Mechanical and Intelligent Manufacturing Technologies.



Anna University Rank Certificate

5th rank among 1367 candidates in BE (Electrical and Electronics Engineering) graduated in 2014.



Erasmus Mundus Scholarship

for European Master on Advanced Robotics Plus (2015–2017) granted by European Commission.



Best Outgoing Student Award

in Department of Electrical and Electronics Engineering, PSNA College of Engineering and Technology in 2014.



Special Recognition Certificate

for the project “Transformer-less grid connected single phase multilevel inverter for photovoltaic system” in Engineer Infinite 2014, a National level engineering student project competition held at ELECRAMA-2014, India.



Nepal Aid Fund Scholarship

Merit-based scholarship scheme (2010–2014) of the Government of India for BE (Electrical and Electronics Engineering).



Mahatma Gandhi Scholarship

Merit-based scholarship scheme (2008–2009) of the Government of India.

LANGUAGES

English



Nepali



Hindi



REFEREES

Available upon request.

- **D. Subedi**, I. Tyapin, and G. Hovland, "Control of redundant flexible manipulators with redundancy resolution," in *2022 8th International Conference on Mechatronics and Robotics Engineering (ICMRE)*, 2022, pp. 116–121. DOI: 10.1109/ICMRE54455.2022.9734097.
- A. Jha, **D. Subedi**, P.-O. Løvslund, *et al.*, "Autonomous mooring towards autonomous maritime navigation and offshore operations," in *2020 15th IEEE Conference on Industrial Electronics and Applications (ICIEA)*, 2020, pp. 1171–1175. DOI: 10.1109/ICIEA48937.2020.9248169.
- **D. Subedi**, A. Jha, I. Tyapin, and G. Hovland, "Camera-lidar data fusion for autonomous mooring operation," in *2020 15th IEEE Conference on Industrial Electronics and Applications (ICIEA)*, 2020, pp. 1176–1181. DOI: 10.1109/ICIEA48937.2020.9248089.
- **D. Subedi**, I. Tyapin, and G. Hovland, "Modeling and analysis of flexible bodies using lumped parameter method," in *2020 IEEE 11th International Conference on Mechanical and Intelligent Manufacturing Technologies (ICMIMT)*, 2020, pp. 161–166. DOI: 10.1109/ICMIMT49010.2020.9041188.
- A. P. del Pobil, M. Kassawat, A. J. Duran, *et al.*, "Uji robinlab's approach to the amazon robotics challenge 2017," in *2017 IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI)*, 2017, pp. 318–323. DOI: 10.1109/MFI.2017.8170448.

Theses

- **D. Subedi**, "Modeling and control of flexible link manipulators," Ph.D. dissertation, University of Agder, 2022.
- **D. Subedi**, "Kinematic control of redundant manipulators," Master's Thesis, Universitat Jaume I, 2017.