CURRICULUM VITAE

AKILA ELANGASINGHE

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EDUCATION

2023 - 2025	Master of Science (Research) (Computational Mechanics of Materials and Structures) University of Stuttgart, Germany
Thesis Topic:	Possibilistic Filtering and Control of a Highly Dynamic Mechanical System in the Presence of Uncertainty
CGPA	1.7/5.0 (German Scale), 4.0/4.0 (US Scale)
Details	Two-year program (full-time). Thesis length 12, 000 words, undertaken over a semester (6 months). Focusing on developing online state estimation methods for systems with imprecisely defined probabilistic noise added with epistemic uncertainties and developing robust model-based control schemes to stabilize such systems. Implementation done in real-time on a physical apparatus. This study is being further developed into a journal article.
Supervisor	Prof. Dr.-Ing. Michael Hanss, Tom Könecke, Mario Rosenfelder, Jan Schneider
2017- 2022	Bachelor of Science (Mechanical Engineering) University of Moratuwa, Sri Lanka
CGPA	3.56/4.2 (19^{th} out of 124)
Supervisor	Dr. Lihil Subasinghe, Mr. Shehara Perera

RESEARCH EXPERIENCE

November 2023 - Present	Research Assistant to Prof Michael Hanss Institute of Engineering and Computational Mechanics (ITM) University of Stuttgart
Responsibilities:	Primarily involved in the uncertainty quantification and robotics branches at ITM • Incorporated uncertain parameters into processes such as FFT, modal analysis and neural networks, where analysis of ANN's with fuzzy valued parameters are considered • Contributed to the development and maintenance of the internal software repository for uncertainty quantification • Designed and manufactured fully 3D-printed small-scale mobile robots and implemented embedded software and hardware for full operation • Investigated control responses for manipulators with parameter-based uncertainty

PROFESSIONAL EXPERIENCE

October 2022 – November 2022	Mechanical Engineer - Battery Research and Development, VEGA Innovations, Colombo, Sri Lanka Battery pack mechanical design pack design for combustion to electric vehicle conversions Drive cycle simulation to evaluate battery efficiency
September 2020 – May 2021 Responsibilities:	Mechanical Engineer, ThermalR Industries, Moratuwa, Sri Lanka Internship in an automotive startup • Directly involved in the designing and manufacturing of the frame and suspension setup for electric bike "Peregrine" • Designed the frame to meet stiffness and weight targets, and assisted in manufacturing chassis and suspension

PROJECT EXPERIENCE

January 2020 – July 2022	Chief Technical Officer, FalconE Racing Team, University of Moratuwa, Sri Lanka
Responsibilities:	Sri Lanka's first and only active electric FSAE project, which is aimed at the design and development of a single-seater race car for Formula Student Competitions • Chassis, Suspension and Steering system mechanical design • FEA simulations to assess the structural viability of mechanical components • CFD thermal analysis to evaluate battery cooling feasibility

SKILLS AND COMPETENCIES

- Solid Mechanics: Strong theoretical foundation in continuum mechanics, engineering materials, and computational mechanics of materials and structures. Experienced in implementing structural simulations for mechanical and thermomechanically coupled load cases using custom codes and open-source libraries (e.g., FEniCS).
- Control Systems: Design and implementation of optimal and robust control systems (MPC, LQR, H-infinity)
- Mechanical Design & Manufacturing: Application awareness in multiple CAD and CAM software (SolidWorks, SolidCAM, Solid Edge, Creo) and Hands-on experience with lathe operations, milling, woodworking, sheet metal fabrication
- Structured Programming competency in MATLAB, Simulink, Python, C++, PLC
- Application Awareness: ANSYS Structural & Fluent, EDEM, ADAMS

LICENSES & CERTIFICATIONS

- Self-Driving Cars Specialization (University of Toronto: Coursera MOOC), July 2023
- Robotics: Areial Robotics (University of Pennsylvania: Coursera MOOC), July 2023
- Applied Control Systems 1 and 2 (UDEMY MOOC), March 2023

RESEARCH PUBLICATIONS

A.I. Elangasinghe, P. Fernando, J. Colombage, S. Perera, and L. U. Subasinghe, "A Theoretical Model to Analyze the Draft Force and Power Requirement of a Tillage Implement Consisting of Both a Disc Plough and a Subsoiler," Moratuwa Engineering Research Conference (MERCon) 2022, Jul. 2022, pp. 1–6.

Type of Publication	Conference Paper
Refereed Publication	Yes
ISSN:	2831-5537 (Print), 2691-364X (Online)
URL:	https://ieeexplore.ieee.org/document/9906158
DOI:	10.1109/MERCon55799.2022.9906158
Authorship Statement:	Development of the novel mathematical model to predict draft force requirement for the combination tillage method and performed Discrete Element Method (DEM) simulations for validation and comparison.

CONFERENCES / WORKSHOPS

- COMMAS Seminar Lecture presented at ITM Statusseminar 2024, Monbachtal, Germany, July 15, 2024, Title: Using Possibility Theory to Design a Robust Optimal Control Scheme for a Highly Dynamic System

- COMMAS Summer School, University of Stuttgart, Germany, October 9, 2024, Poster Presentation, Title: Ellipticity of Gradient Poroelasticity

GRANTS AND AWARDS

- Certificate for contribution towards Team FalconE at IMechE Student Awards Apr. 2022
  Institute of Mechanical Engineers, University of Moratuwa Chapter
  Awarded for contribution as the Chief Technical Officer for the FalconE racing Team for period of 2021-2022
- Deans list - Semester 8 Aug. 2022
  Department of mechanical engineering, University of Moratuwa
  Scholarly honour awarded for gaining semester GPA above 3.8 out of a possible 4.2

REFEREES

- Prof. Dr.-Ing. Prof. E.h. Peter Eberhard
  Director and Full Professor
  Institute of Engineering and Computational Mechanics
  University of Stuttgart, Germany
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  Deputy Director
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