

# Kazi Sher Ahmed

Mechatronics Engineer

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RESEARCH INTERESTS	Control systems, active magnetic bearing (AMB), rotordynamics, ultra-high-speed motors	
EDUCATION	<b>Doctoral Studies – Sabanci University, Turkiye</b> Mechatronics Engineering (coursework completed) <ul style="list-style-type: none"><li>• Dissertation Topic: Optimization and Realization of AMB Spindle for Chatter Suppression</li><li>• Advisor: <a href="#">Dr. Bekir Bediz</a></li><li>• Relevant Coursework: Machine Learning, Metal Cutting Mechanics, Tribology, Scaling in Energy Systems</li><li>• Status: Program paused due to family obligations. Currently finalizing publications</li></ul>	Sep. 2021 – July 2023
	<b>MS – Sabanci University, Turkiye</b> Mechatronics Engineering <ul style="list-style-type: none"><li>• Thesis: Design of Active Magnetic Bearing Spindles for Micro-Milling Applications</li><li>• Advisor: <a href="#">Dr. Bekir Bediz</a></li><li>• Relevant Coursework: Real-Time Systems, Integrated Sensors, Mechanical Vibrations, Topology Optimization, Finite Element (FE) Method, Machine Tool Engineering</li></ul>	Sep. 2018 – July 2021
	<b>BS – GIK Institute, Pakistan</b> Mechanical Engineering <ul style="list-style-type: none"><li>• Senior Year Project: Development &amp; Finite Element Modeling of a Rotor-Bearing Testrig</li><li>• Award: Second Best Senior Year Project</li></ul>	Aug. 2011 – June 2015
JOURNAL PAPERS & MANUSCRIPT	<b>K S Ahmed</b> , G Kiziltas, & B Bediz, 2026, ‘Design framework and manufacturing of an active magnetic bearing spindle for micro-milling applications’, <i>Preprint</i> <b>K S Ahmed</b> , G Kiziltas, & B Bediz, 2025, ‘ <a href="#">Integrated design optimization of a motorized active magnetic bearing spindle for micro-milling applications</a> ’, <i>Journal of Mechanical Science and Technology</i> , vol. 39, pp. 2015–2027 <b>K S Ahmed</b> & S M Ahmad, 2019, ‘ <a href="#">VibronRotor, an open-source rotordynamic code: Development and benchmarking</a> ’, <i>Measurement</i> , vol. 131, pp. 546–558	
CONFERENCE PAPERS	<b>K S Ahmed</b> & B Bediz, 2022, ‘ <a href="#">Design of an active magnetic bearing spindle for micro-milling applications</a> ’, <i>19th International Conference on Machine Design and Production</i> , Cappadocia, Turkiye, Aug. 31–Sep. 3 A Rehman, <b>K S Ahmed</b> , F A Umrani, B Munir, A Mehboob, Z Kazmi, & S M Ahmad, 2015, ‘ <a href="#">Finite element modeling of a generic rotor-bearing system and experimental validation</a> ’, <i>ASME Dynamic Systems and Control Conference</i> , Ohio, USA, Oct. 28–30	
RESEARCH PROJECTS	<b>Design Framework &amp; Manufacturing of AMB Spindle</b> Graduate Researcher [ <a href="#">Preprint</a>   <a href="#">UMTIK Paper</a> ] <ul style="list-style-type: none"><li>• Proposed a systematic framework to design and manufacture a micro-milling AMB spindle with an aim to consolidate fragmented design knowledge</li><li>• Validated the framework as a case study involving topology selection, modeling, optimization, analysis, and manufacturing of spindle components</li><li>• Manufactured the physical prototype and executed manufacturing/assembly decisions for reproducibility of similar AMB spindles</li></ul>	Sabanci University 2019 – 2023
	<b>Integrated Design Optimization of Motorized AMB Spindle</b> Graduate Researcher [ <a href="#">JMST Paper</a> ] <ul style="list-style-type: none"><li>• Co-authored a successful grant proposal (TUBITAK Grant: 123M121)</li><li>• Developed a multidisciplinary design optimization workflow integrating often separately treated AMB and motor performance</li></ul>	Sabanci University 2022 – 2023

- Employed analytical models covering electromagnetics, mechanics, & rotordynamics
- Constructed a 3D finite-element model to: (i) analyze and reduce AMB-motor electromagnetic coupling, (ii) numerically correct the AMB analytical model
- Generated Pareto-optimal designs optimizing torque-to-loss ratio & spindle mass enabling design selection based on application requirements

### Open-Source Rotordynamic Software

GIK Institute

Laboratory Engineer [\[Measurement Paper\]](#) | [\[Code\]](#)

2017 – 2018

- Developed and benchmarked VibronRotor, an open-source finite-element rotordynamic code compatible with MATLAB and free scientific programming language GNU Octave
- Implemented key analysis: Campbell diagram, critical speed map, mode shapes, imbalance response, orbit plots, & instability threshold analysis
- Instrumented a rotor testrig with eddy current probes for experimental modal analysis for code validation

### SKILLS

*Methods:* FE analysis, electromagnetics, rotordynamics, control system design, design optimization, experimental modal analysis

*Programming & numerical computing:* C/C++, Python, MATLAB, Mathematica

*CAD & simulation:* Solidworks, COMSOL, ANSYS, MATLAB/Simulink

*Experimental & data acquisition:* Testrig instrumentation, LabVIEW

### PEER REVIEW SERVICE

[Journal of the Brazilian Society of Mechanical Sciences and Engineering, Springer](#)  
[Journal of Mechanical Science and Technology, Springer](#)

### WORK AND TEACHING EXPERIENCE

**Graduate Researcher & Teaching Assistant, Sabanci University** Sep. 2018 – May 2023

- Research outcome: 1 journal article (JMST 2025), 1 conference paper (UMTIK 2022), 1 preprint
- Weekly recitations, grading, and office hours for courses: Control Systems, Mechanical Vibrations, Linear Algebra, Statics, Dynamics, Mechanical Systems, Discrete Mathematics, Calculus
- Mentored undergraduate students on the development of an active magnetic damper

**Laboratory Engineer, GIK Institute**

Sep. 2016 – Aug. 2018

- Research outcome: 1 journal article (Measurement 2019), open-source rotordynamic code
- Designed & conducted lab experiments in Mechanical Vibrations and Fluid Mechanics
- Teaching assistant course assignments: Fluid Mechanics, Mechanical Vibrations
- Served as Problem-Based Learning Committee Coordinator

**Project Engineer, GIK Institute**

Sep. 2015 – Aug. 2016

- Designed & conducted computational fluid dynamics analysis of a micro-hydro Kaplan turbine for a Khyber-Pakhtunkhwa Govt. Project
- Delivered a seminar talk on ‘Indigenous R&D of Micro-Hydro Power Plants’, CIIT Lahore (2016)

**Summer Intern, K-Electric Combined Cycle Power Plant**

June 2014 – July 2014

- Completed on-site trainings on plant operations and delivered technical reports

**Research Intern, MARC, Koc University**

July 2013 – Aug. 2013

- Designed & conducted stress analysis of a dynamically-loaded spring for linear compressors

**HammerHead Arc (Shell Eco-marathon team)**

Dec. 2012 – May 2015

- Led the team and represented Pakistan in Shell Eco-marathon 2015, Philippines
- Project goals: Design, fabrication, & testing of an ultra energy-efficient electric vehicle

**Managing Editor, Science Aurora Magazine**

Aug. 2012 – May 2013

- Researched content, wrote articles, & managed the project

### AWARDS

- Graduate studies tuition waiver & stipend support at Sabanci University, Turkiye (2018–2023)
- Second position in Senior Year Project Competition at GIK Institute (2015)
- Represented Pakistan in Shell Eco-marathon Asia, Manila, Philippines (2015)
- Best Design Award in National Shell Eco-marathon Off-track Event, Pakistan (2015)
- Sixth position in Battery Electric Category, 2014 Shell Eco-marathon Asia, Manila. Project also won Best Ecological Footprint Award at National Shell Eco-marathon event (2014)

MEMBERSHIP    American Society of Mechanical Engineers (ASME)

TEST SCORES    TOEFL: 106/120 (2021)

REFERENCES    **Dr. Bekir Bediz**  
Associate Professor, Sabanci University, Turkiye  
[bbediz@sabanciuniv.edu](mailto:bbediz@sabanciuniv.edu) (MS-PhD advisor)

**Dr. Gullu Kiziltas Sendur**  
Professor, Sabanci University, Turkiye  
[gkiziltas@sabanciuniv.edu](mailto:gkiziltas@sabanciuniv.edu) (Research collaborator)

**Dr. Sarvat Mushtaq Ahmad**  
Associate Professor, King Fahd University of Petroleum and Minerals, Saudi Arabia  
[sarvat.ahmad@kfupm.edu.sa](mailto:sarvat.ahmad@kfupm.edu.sa) (BS advisor & research collaborator)

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