CURRICULUM VITAE
AKSHAY KARGAONKAR

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SUMMARY

A results-driven Mechanical Engineer with expertise in design, simulation, and IoT-enabled product development, recognized with the Red Dot Design Award for contributions to sustainable designs.

Proficient in CAD, simulation tools, and programming (MATLAB, Python, C++), with experience in manufacturable design, CNC operations, and plastic injection molding.

WORK EXPERIENCE

Research and Development Engineer **Sept 2022 - Present**
DG TAKANO Co., Ltd. (website) *Osaka, Japan*

- **IoT-Enabled Smart Kitchen Faucet Project (Japanese Government-Subsidized Initiative)**
  - Currently heading the development of an IoT-integrated kitchen faucet system as a Mechatronics Engineer.
  - Designed and embedded temperature and flow rate sensors into a custom in-house faucet as a cost-effective solution.
  - Supported in establishing real-time data tracking and analysis through integration with AWS cloud.
  - Working on converting this IoT system into a separate product compatible with every faucets at every household in Japan.
- **5a-faucet: A water saving innovation with enhanced mobility** (website)
  - Designed and Developed a faucet head with an autonomous switching mechanism for laminar and aerated flows, enhancing water efficiency to 60% based on user input through sensors.
  - Performed extensive durability testing of different degrees of freedom of the faucet body, simulating over 100,000 cycles of the faucet's various movements.
  - Engaged in discussions with manufacturers in Guangdong, China, by visiting their facilities for quality checks and to ensure timely completion of mass production.
- Re-designed and developed a **self-powered pulsating flow nozzle** for kitchen faucets, bidets, and the electronic industry, optimizing cleaning processes for semiconductors.
- As a pivot, connected DG TAKANO with cross-cultural manufacturers (China's PARLOS, South Korea's BONGYONG, Vietnam's VN), **cutting production time and cost.**
- Other activities:
  - Designing and building **physical rigs** for endurance testing, by selecting optimal actuators and power transmission mechanisms.
  - Product planning and specification, cost-effective manufacturable designs, machinability assessments, documentation of processes, Bill of Materials, 2D schematics.
- **Tools and Technologies:** Programming and operating Nakamura-Tome multi-turret lathe machines using G-code, prototyping using KEYENCE Polyjet 3D printers, Autodesk FUSION360, SolidWorks, MIRO.

EDUCATION

Indian Institute of Technology, Indian School of Mines, Dhanbad, India **2018 - 2022**
Bachelor of Technology in Mechanical Engineering CGPA: 8.01/10.00 (degree)

Relevant Coursework- *Kinematics of Machines, Dynamics of Machinery, Advanced Solid Mechanics, Finite Element Analysis, Rapid Prototyping, Robotics (Transcripts)*

Thesis- *Diffusiophoresis of a confined Janus particle (Simulating the movement of Janus particle using Comsol Multiphysics) (Thesis)*

RESEARCH LAB EXPERIENCE

Laboratorio de Ingeniería Mecánica, UDC Spain **Oct 2020 - Apr 2021**
Project under Prof. Javier Cuadrado *Remote, India*

- Collaborated with Professor Cuadrado's team to conduct **real-time co-simulation** of multiphysics systems, fostering interdisciplinary insights and advancements in system dynamics and integration.
- Utilized MATLAB to create and simulate benchmark mechanical subsystems, employing various solving methods and **streamlining simulation time** for optimal performance evaluation.

Formula Student - Mechismu Racing, IIT ISM **2019 - 2022**
Team member under Dr. Nirmal Kumar Singh *Dhanbad, India*

- Engaged in advanced **modeling and simulation of the suspension system** for the IIT ISM Formula Student vehicle using MSC ADAMS, contributing to enhanced stability of the vehicle. (link)
- Directed a thorough analysis of **driver ergonomics to reduce injuries** from steering torque, showcasing a keen focus on performance enhancement while ensuring safety.

PUBLICATIONS

Akshay Kargaonkar, N.K. Singh, **"Multibody Dynamic Simulation of A Mountain Bike To Reduce Riding Injuries During A Jump Event**," *in IJERT Journal*, vol. 12, issue 6, 29 June, 2023. **DOI**

Akshay Kargaonkar, N.K. Singh, **"A Study on Modeling and Simulation of different Friction Models in Multibody Dynamics**," *in EJMS Journal.* (submitted) (link)

SKILLS

CAD softwares	Autodesk Fusion360, CATIA V5, SolidWorks
Simulation softwares	ANSYS Mechanical, FLUENT, ADAMS, COMSOL Multiphysics
Programming languages	C, C++, Python, MATLAB
Languages	English(Bilingual proficiency), Japanese(Limited working proficiency)
Others	Worked with various Sensors, Micro-controllers and Development boards

ACHIEVEMENTS

- Contributed to the design and development of DG Takano's MeliorDesign Dishware, which received the **Red Dot Design Award: Product Design 2024**. (link)
- Entry to the **The Red Dot: Best of the Best award 2025** for the 5a faucet as a Product Engineer.
- Led the formula student team to secure a top-10 ranking in the Formula Bharat 2021 design category, showcasing strong leadership and technical expertise as the **Technical Head**.
- Achieved the **Best Paper Award** at the 2021 Young Scholars' National Research Writing Competition.
- **IELTS Academic** overall score: **8.5**, R: 9.0, L: 9.0, W: 7.5, S: 7.5 - November, 2023.

EXTRA-CURRICULARS

- Certified as an **Open Water Diver** by the Professional Association of Diving Instructors (PADI), showcasing proficiency in scuba diving and a commitment to adventure and exploration.
- Active **volunteer at English camps** in Japan, aimed at teaching Elementary school students English.
- Involved in organizing meetups for the artist community in Osaka, alongside a personal pursuit of **digital art, and animation** that draws inspiration from Japanese animation studios.