

# Videsh Vijayashanmugam Kamala

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## EDUCATION

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### University of Michigan, Ann Arbor

GPA : 4.0

Master's (M.S.E) in Mechanical Engineering

Aug. 2025 - May. 2027

Relevant Coursework: **Advanced Fluid Mechanics, Compressible Flow.**

### Indian Institute of Information Technology, Design & Manufacturing, Kancheepuram

GPA : 8.89/10.0

Bachelor's (B-Tech) in Mechanical Engineering

Dec. 2021 - Jul. 2025

Relevant Coursework : **Heat Transfer**, Thermodynamics, **FEA, Numerical Methods, CFD, Inverse Problem Solving**, Mechanics of Materials, Systems Thinking for Design.

## SKILLS

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- **Numerical Simulation:** CFD/FVM (ANSYS Fluent, Converge CFD), FEM (COMSOL), Multiphysics Modeling, Turbulence Modeling (RANS & Realisable  $k - \epsilon$ ), Convective Heat Transfer, DNS-Scale Workflows (PARDISO), Mesh Verification/Validation, Simulation Automation, Thermal Modeling.
- **Programming:** Python, MATLAB (Simulink), C, C++, JavaScript.
- **Software:** ANSYS Workbench/Mechanical, SolidWorks (CSWA), Fusion 360, Adobe Photoshop/Illustrator/Premiere.
- **Leadership:** Vice-Chairperson, ASME Student Section; Lead, Photography Club.

## WORK/ACADEMIC EXPERIENCE

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### Mechanical Design Team Intern

Hosur, Tamil Nadu

*HyperHorizon PVT LTD*

Apr. 2024 – Jul. 2024

- **Validated AUV trajectory prediction within 10% error** by developing the equations of motion and integrating Bayesian state estimation with flow-based models for PID control testing.
- Delivered a fully functional AUV outer shell by leading end-to-end production, using CAD parametric modeling with GD&T and hands-on FDM fabrication, which **cut iteration time by  $\approx 30\%$**  and **improved fit accuracy within 0.5mm** across prototypes.
- Ensured production-ready hardware by drafting release-grade part files and **executing two-stage quality checks**, verifying geometry, tolerances, and assembly interfaces prior to fabrication.

### Mechanical Team Member

Chennai, Tamil Nadu

*MaRS: Mars Research Society, IITDM Kancheepuram*

May. 2022 – Apr. 2023

- Achieved a **global rank of 4 in the ERC** by engineering a 3-legged rocker-bogie suspension based mars rover to compensate for off-center mass from a side-mounted 5 DOF manipulator and onboard analysis station, enabling stable 70 kg payload support and 45° terrain traversal, surpassing baseline mechanical specifications.
- Derived suspension kinematics equations to model wheel and motor trajectories about the pivot, using predicted motion paths to optimize clearances, mitigate rollover risk, and reduce lateral instability, **improving system reliability for upto  $1.4\times$  design loads**.
- Validated wheel-motor **clearances within 8mm** across the full suspension travel relative to analytically predicted trajectories by fabricating and comparing with FDM-based full-system prototypes.

### Research Assistant

Chennai, Tamil Nadu

*Microscale Transport Laboratory (eMpTy), IITDM Kancheepuram*

May. 2023 - Jul. 2025

- Simulated inhomogeneous flows and droplet acoustofluidics in micro/nano domains via COMSOL, validating flow physics against analytical models and **verifying within a 5% error margin**.
- Identified and quantified stability bifurcation, resulting in  **$\approx 1.8X$  the sub-micron particle sorting efficiency** by using a simpler two channel domain for co-flowing fluids.
- Selected as **1 of 70 presenters worldwide** at Acoustofluidics'24; delivered a research presentation as the only undergraduate, earning international exposure within the acoustofluidics community.

## PROJECTS

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### Rehabilitation Glove with Twisted String Actuators

*Research Assistant at MIDAS Lab, IITDM Kancheepuram*

Dec. 2022 - Mar. 2023

- **Reduced system cost to 33%** of commercial alternatives by developing a low-cost exoskeletal glove using three independent twisted string actuators with synchronized finger motion and dynamic stiffness control for back-draw operation.

### 5-DoF 3D-Printed Pick-and-Place Manipulator for Flipkart GRID Competition

*Mechanical Subsystem*

Nov. 2023

- Designed a low-cost 3D-printed two-jaw gripper manipulator using spur gears for single-point actuation and synchronized end-effector motion, capable of lifting weights upto 4Kg; **qualified nationwide among 400 teams**.