Dileep Kumar

Ph.D. Candidate at IITK

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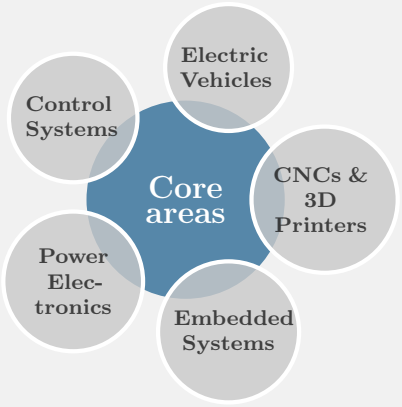
Fields of Expertise



Technical Skills

- Octave, MATLAB/Simulink
- Linux/Unix
- Latex
- Embedded C/C++
- dsPIC, STM32, ESP32, 8051
- CAN, SPI, I2C, QEI
- Hardware Development

Extracurricular Skills

Practitioner of TEAM-CBT (by Dr. David Burns)

- Healthy Emotions
- Healthy Relationships with Others
- Better Communication Skills

Education

2015 – 2023	Ph.D. **[CGPA: 8.00/10]** [Thesis Submitted] Control and Automation, Electrical Engineering	**IIT Kanpur, India**
2010 – 2012	M.Tech **[CGPA: 8.25/10]** Control Systems, Electrical Engineering	**NIT Patna, India**
2010 – 2012	B.Tech **[CGPA: 7.62/10]** Electronics and Communication Engineering	**SMVDU J&K, India**

Research and Teaching Employments

2022 – To date	Senior Student Research Associate **[Part Time]** Department of Electrical Engineering	**IIT Kanpur, India**
2019 – 2021	Tutor (Spring 2019, 2020 & 2021) **[Part Time]** Department of Electrical Engineering	**IIT Kanpur, India**
2015 – 2021	Teaching Assistant (2015, 2016, 2017, 2018, Fall 2019, Fall 2020, Fall 2021) **[Part Time]** Department of Electrical Engineering	**IIT Kanpur, India**
2012 – 2015	Assistant Professor **[Full Time]** Department of Electrical Engineering	**NIET, Jaipur, India**

Research Experiences

Ph.D. Research: *Energy Usage and Tire Usage for Electric Vehicles with In-Wheel Motors*

Energy Usage
–**Tank-to-Wheel** (TTW) Energy Efficiency of **Battery Electric Vehicles** (BEVs) Belonging to the Category of **Bikes, Microcars, Mid-size Cars, Full-size Cars and Buses**.
–These BEVs widely use **Single Central Motor**, and **Single or Multiple In-Wheel Motors (IWMs)**.
–**Well-to-Wheels** Energy Efficiency of BEVs and ICE Vehicles.

Tire Usage
–Study of **Four-Wheel Independent Steering Four-Wheel Independent Drive** (4WIS4WID) EVs, as These EVs Have the Potential to Achieve a Condition Known as **Optimal Tire Usage** (OTU).
–Examination of **Five** Existing Works **Block-Diagrammatically** for How Well their Path-Tracking Control Algorithms may Achieve OTU.
–Recommendations of **Disturbance Observer-Based Control** (DOBC) and **Active Disturbance Rejection Control** (ADRC) Schemes to be used in **Motor Control Systems** for OTU.

M.Tech Research: *Modeling and Control of Emerging Generation Technologies-based Distributed Generation System*

–Modeling of **Battery**, **Fuel Cell**, and **Photovoltaic (PV) Array.**
–Control and Simulation of **Smart Backup System** for PV Array.
–**Maximum Power Point Tracker** for PV array.

B.Tech Projects: *Demonstrations of Full-Duplex Communications*

8051
–**Data Acquisition System** for Real-Time **Full-Duplex Communication** using Atmel 8051 and RS485 using **Assembly and C**.

Sparton 3E kits
–**Full-Duplex Communication** between Two Spartan-3e Kits, along with a Computer with 2400, 4800, and 9600 bps using **VHDL**.

Research Project Handling Experience

Human-Driven Full-Size 4WS4WD Electric Vehicle
(Funded by DST-SERB, INDIA)

–Involved in **Proposal Writing**.
–Involved in the **Vehicle Development**.
–Developed **Driving Motor Control Systems** for the Vehicle.

Dileep Kumar

Ph.D. Candidate at IITK

References

1. Dr. Ramprasad Potluri (Ph.D. Supervisor)

Associate Professor,
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2. Dr. Ashiwani Kumar (M.Tech Supervisor)

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3. Dr. Manish Sabraj (B.Tech Supervisor)

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4. Dr. Kumud Ranjan Jha

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Professional and Technical Experiences

Electric Vehicles	– **Path-Tracking Control** Algorithms of 4WIS4WID EVs . – **Optimal Tire Usage** in 4WIS4WID EVs . – Involved in the Development of a **Human-Driven Full-Size 4WIS4WID EV** at IITK. – Experience with **Hardware-in-Loop Simulator (HILS)** for Path-Tracking Control of a 4WIS4WID EV Small-Scale Testbed Developed at IITK. – Experience in deploying **CAN Communication** with 8 Nodes used in the Testbed. – **Tank-to-Wheels** and **Well-to-Wheels** Energy Efficiency of BEVs with **In-Wheel Motors** (IWMs). – **DOBC** and **ADRC** Schemes for IWMs.
Motor Control Systems	– **3 Year** Experience in **Designing and Implementing Control Systems** for DC Motors at *Control Systems Laboratories* of IITK. – Implemented **Speed and Current Tracking** Control Systems for DC and **BLDC Motors** Using **High-Gain** Control and **DOBC** Schemes.
Power Electronics	–Developed a **48 V Inverter** for a **Brushless DC Motor** using IC **DRV8320S** Interfaced with a **Microcontroller**. – Developed a **Maximum Power Point Tracking** Controller for **PV Array**.
CNCs	–Experience with Controllers Involved in **CNC Machines and 3D Printers**.

Fellowships and Grants

2020 – 2021	Institute Fellowship during Ph.D. Department of Electrical Engineering	**IIT Kanpur, India**
2015 – 2020	MHRD Scholarship during Ph.D. Department of Electrical Engineering	**IIT Kanpur, India**
2010 – 2012	MHRD Scholarship during M.Tech Department of Electrical Engineering	**NIT Patna, India**

Training and Courses

2009	Redhat Enterprise Linux-5	**SMVDU J&K, India**
2007	Science of Yoga	**SMVDU J&K, India**

Scientific Events Attended/Organized

2023	Oral Presentation at Institute Research Symposium (IRS'23)	**IIT Kanpur, India**
2018	Organizing student member of Indian Control Conference (ICC)	**IIT Kanpur, India**
2017	Organized a Short-term QIP course on Frequency Domain Control System Design & Experiments	**IIT Kanpur, India**
2016	Attended Indian Control Conference (ICC)	**IIT Hyderabad, India**
2013	Oral Presentation at IEEE International Conference on Advanced Research in Engineering and Technology, ICARET-2013	**KL University, India**

Publications

Published	**Dileep Kumar, Vasu Jain, and Ramprasad Potluri, "Energy efficiency of battery electric vehicles with in-wheel motors",** ***SAE International Journal of Sustainable Transportation, Energy, Environment, & Policy, 4(13-04-01-0002), 2022.***
Under Review	**Dileep Kumar and Ramprasad Potluri, "Significance of Motor Control Systems for Optimal Tire Usage in 4WIS4WID Electric Vehicles",** ***IEEE Transactions on Intelligent Transportation Systems.***

May 25, 2023 **Dileep Kumar**