# 2025 VIPR-GS Research Center
# Annual Review Agenda
## *Clemson University – Clemson, South Carolina*

**Tuesday, February 25th**
**Fueling Partnerships: A VIPR-GS Industry Innovation Social – Sole/Joe's Bar at the Clemson University Madren Conference Center**

6:00 PM-until… **Fueling Partnerships: A VIPR-GS Industry Innovation Social**

*Sole/Joe's Bar at the Clemson University Madren Conference Center*

**Dr. Venkat Krovi,** *VIPR-GS Associate Director, Industry Relations*

This reception celebrates the partnerships and innovations that drive the VIPR community. The event provides an engaging opportunity for Annual Review attendees who arrive in town early to connect and enjoy the evening in a relaxed setting.

The reception will feature a selection of heavy hors d'oeuvres and beverages, offering an ideal environment to network with industry leaders, researchers, and partners.

We hope you can join us as we recognize the collaborative efforts that propel VIPR forward.

# 2025 VIPR-GS Research Center Annual Review Agenda

*Clemson University – Clemson, South Carolina*

**DAY 1 Morning: Wednesday, February 26th**
**Clemson University Madren Conference Center**

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|---|---|---|
| 8:00 AM-8:30 AM | **Continental Breakfast / Networking** | *Grand Hallway* |
| 8:30 AM-9:00 AM | **Welcome / VIPR Research Center Update**<br>**Dr. Anand Gramopadhye**, Clemson Dean of the College of Engineering, Computing, and Applied Sciences<br>**Dr. Robert Prucka**, Director, Center for Virtual Prototyping of Ground Systems Center<br>**Dr. Pamela Murray-Tuite**, Deputy Director, VIPR-GS | *Grand Ballroom* |
| 9:00 AM-9:45 AM | **Keynote — Government**<br>**Dr. Philip A Frederick**<br>The US Army's Deputy Chief Scientist for Ground Vehicle Systems and S&T Fellow | *Grand Ballroom* |
| 9:45 AM-10:00 AM | **Networking Break** | *Grand Hallway / North Lobby* |

10:00 AM-12:00 PM **Concurrent Research Project Presentations**

| **Autonomy**<br>**Dr. Yunyi Jia**, session chair<br>*Auditorium* | **Power and Electrification**<br>**Dr. Beshah Ayalew**, session chair<br>*Meeting Room 1* | **Digital Engineering**<br>**Dr. Greg Mocko**, session chair<br>*Meeting Room 4* |
|---|---|---|
| 1.22.6 – Open-Autonomy Verification & Validation (V&V) Framework<br>• Dr. Venkat Krovi | 2.22.9 – Stochastic Powertrain-Mobility Optimal Control for High Dynamic Off-Road Driving<br>• Dr. Qilun Zhu | 3.22.8 – Efficient Modeling and Guiding of Experimental Investigations of High-Performance Pistons Leveraging Bayesian and Machine Learning Approaches<br>• Dr. Laura Redmond |
| 1.23.13 – PRECOgniTION: PRobabilistic prEdiction from CONtext determinaTION<br>• Dr. Matthias Schmid | 2.22.7 – Vehicle Propulsion Digital Twins and HIVE<br>• Dr. Benjamin Lawler | 3.22.10 – Cross-cutting Tradespace Techniques for Ground Vehicle Systems<br>• Dr. Yongjia Song |
| 1.22.7 – Investigation of emulators for Single Photon Lidar to determine its suitability for autonomous vehicle integration<br>• Dr. Goutam Koley | 2.23.13 – Optimal Thermal Management Strategies for Off-Road Hybrid Electric Autonomous Vehicles in Extreme Ambient Conditions<br>• Dr. Robert Prucka | 3.22.11 – Advanced Visualization, Simulation, and Human Integration through the Digital Design and Simulation Studio<br>• Dr. Greg Mocko |

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| 12:00 PM-1:10 PM | **LUNCH** | *Grand Ballroom* |
| 12:30 PM-1:10 PM | **Deep Orange Program Update**<br>**Dr. Robert Prucka**, Director, VIPR-GS Research Center Director, Deep Orange Vehicle Prototyping Program | *Grand Ballroom* |

DAY 1 Afternoon: Wednesday, February 26th
Clemson University Madren Conference Center

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| 1:10 PM-1:55 PM | **Keynote — Developing Batteries for Safe Operation in a Wide Temperature Range**<br>**Dr. Apparao Rao**, Founding Director, Clemson Nanomaterials Institute<br>R. A. Bowen Endowed Professor of Physics | *Grand Ballroom* |
| 1:55 PM-2:10 PM | **Networking Break** | *Grand Hallway / North Lobby* |
| 2:10 PM-3:30 PM | **Concurrent Research Project Presentations** | |

| **Autonomy**<br>**Dr. Yunyi Jia**, session chair<br>*Auditorium* | **Power and Electrification**<br>**Dr. Beshah Ayalew**, session chair<br>*Meeting Room 1* | **Digital Engineering**<br>**Dr. Greg Mocko**, session chair<br>*Meeting Room 4* |
|---|---|---|
| 1.22.9 – Spatial-AI Real-Time Mapping for Off-Road Ground Vehicles<br>• Dr. Bing Li | 2.22.6 – Vehicle Propulsion Digital Twins: HPC-based Next Generation High-Fidelity Powertrain Co-Simulation for Ground Vehicle Systems<br>• Dr. Shuangshuang Jin | 3.6 – Collaborative Design Teaming and Immersive Technologies for Ground Vehicle Systems Design<br>• Dr. Greg Mocko |
| 1.23.15 – Virtual Sensor Reconstruction for offroad autonomous vehicle<br>• Dr. Feng Luo | 2.23.10 – High Power Density Engines and Propulsion Systems<br>• Dr. Benjamin Lawler | 3.7 – Computationally Augmented Decision Making in Model Creation, Validation, and Trade Space Evaluation<br>• Dr. John Wagner |

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| 3:30 PM-3:45 PM | **Networking Break** | *Grand Hallway / North Lobby* |
| 3:45 PM-4:25 PM | **Concurrent Research Project Presentations** | |

| **Autonomy**<br>**Dr. Yunyi Jia**, session chair<br>*Auditorium* | **Power and Electrification**<br>**Dr. Beshah Ayalew**, session chair<br>*Meeting Room 1* | **Digital Engineering**<br>**Dr. Greg Mocko**, session chair<br>*Meeting Room 4* |
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| 1.22.8 – Determining Soldiers' Workload while Operating Ground Vehicles<br>• Dr. Johnell Brooks | 2.23.14 – Laser 3D Printing of Highly Compact Mobile Protonic Ceramic Fuel Cell System for Vehicle Power Supply<br>• Dr. Joshua Tong | 3.23.12 – Online Surrogate Optimization of the Tradespace<br>• Dr. Margaret Wiecek |

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| 4:25 PM-7:30 PM | **VIPR EXPO**<br>• Networking Reception (including heavy hors d'oeuvres)<br>• Student Poster Session<br>• New faculty (project overview poster)/New PI quad member networking | *Grand Ballroom* |

# 2025 VIPR-GS Research Center Annual Review Agenda
*Clemson University – Clemson, South Carolina*

**DAY 2 Morning: Thursday, February 27th**
**Clemson University Madren Conference Center**

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|---|---|---|
| 8:00 AM-8:10 AM | **Opening Remarks**<br>**Dr. Robert Prucka**, Director, Center for Virtual Prototyping of Ground Systems | *Grand Ballroom* |
| 8:10 AM-8:55 AM | **Keynote — From On-Road Autonomy to Off-Road Autonomy**<br>**Dr. Yunyi Jia**, McQueen Quattlebaum Associate Professor, Automotive Engineering | *Grand Ballroom* |
| 8:55 AM-9:10 AM | **Networking Break** | *Grand Hallway / North Lobby* |
| 9:10 AM-10:30 AM | **Concurrent Research Project Presentations** | |

| **Autonomy**<br>**Dr. Yunyi Jia**, session chair<br>*Auditorium* | **Power and Electrification**<br>**Dr. Beshah Ayalew**, session chair<br>*Meeting Room 1* | **Digital Engineering**<br>**Dr. Greg Mocko**, session chair<br>*Meeting Room 4* |
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| 1.23.10 – Monitoring and maintaining trustworthy networked autonomy in a zero trust environment<br>• Dr. Fatemeh Afghah | 2.23.12 – Physics guided discovery of electrolytes for low-temperature batteries<br>• Dr. Apparao Rao | 3.23.13 – Leveraging Emerging Natural User Interface Technology to Support Optimal Soldier-Vehicle Interaction in Next-Generation Autonomous Vehicles<br>• Dr. Julian Brinkley |
| 1.23.12 – Standardized modular secure firmware update framework for military vehicles<br>• Dr. Mert Pese | 2.23.11 – Passive battery pack-level thermal management and energy hybridization for operation in -40 to 70 °C range<br>• Dr. Ramakrishna Podila | 3.2 – Model Interface Specification and Environment to Support Model Integration<br>• Dr. Greg Mocko |

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| 10:30 AM-10:45 AM | **Networking Break** | *Grand Hallway / North Lobby* |
| 10:45 AM-11:25 AM | **Keynote — Connecting Research to Readiness: NSF and U.S. Army DEVCOM Partnership**<br>**Dr. Talia Sebastian**, National Science Foundation Fellow | *Grand Ballroom* |
| 11:25 AM-12:45 PM | **Concurrent Research Project Presentations** | |

| **Autonomy**<br>**Dr. Yunyi Jia**, session chair<br>*Auditorium* | **Power and Electrification**<br>**Dr. Beshah Ayalew**, session chair<br>*Meeting Room 1* | **Digital Engineering**<br>**Dr. Greg Mocko**, session chair<br>*Meeting Room 4* |
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| 1.23.14 – Off-Road Obstacle Detection Analysis for Autonomy-Enabled Ground Vehicle Navigation<br>• Dr. Judith Mwakalonge | 2.22.8 – Multiscale Modeling of High-Temperature All-Solid-State Battery Cells and Packs<br>• Dr. Apparao Rao | |
| 1.23.11 – VANTAGE: Vehicular Aerial Navigation of Tethered Autonomous Ground Systems<br>• Dr. Matthias Schmid | | |

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|---|---|---|
| 12:45 AM-1:45 AM | **LUNCH** | *Grand Ballroom* |

| DAY 2 Afternoon: Thursday, February 27th<br>Clemson University Madren Conference Center | | |
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| 12:45 PM-1:45 PM | **Closed Review Session** (time extended as needed)<br>Academic Review Board | *Board Room* |
| 1:45 PM-3:00 PM | **Academic Review Board Feedback and Wrap-up**<br>GVSC Leadership, VIPR-GS Leadership | *Meeting Room 4* |