Opportunity Title: Investigation of Variable Energy Assisted Compression Ignition
Opportunity Reference Code: ARL-R-MS-400032-F1

Organization DEVCOM Army Research Laboratory

Reference Code ARL-R-MS-400032-F1

Description DEVCOM Army Research Laboratory is working on a Multi-fuel Capable Hybrid Electric Propulsion project to enable improved propulsion efficiency and multi-fuel capability for small engines for unmanned vehicle propulsion. One of the key component technologies to enable multi-fuel capability is Variable Energy Assisted Compression Ignition (VEACI) that will investigate variable energy assist technologies to enable adaptive propulsion with wider range of fuels. The candidate shall characterize the limitations of energy addition technologies, develop their capabilities and control, and integrate ignition/combustion sensing and control architecture. The candidate shall have a profound understanding of engine combustion processes and analytical skills to develop control logic. The candidate will research closely with the ARL engineers to develop VEACI technologies that will provide operational flexibility to the Army air and ground systems.

Keywords: Combustion, Ignition, compression ignition, detection, control

ARL Advisor:

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About ARD

ARL's Army Research Directorate (ARD) focuses on exploiting concept development, discovery, technology development, and transition of the most promising disruptive science and technology to deliver to the Army fundamentally advantageous science-based capabilities through laboratory's 11 research competencies. This intramural research directorate also manages the laboratory's essential research programs, which are flagship research efforts focused on delivering defined outcomes.

About ARL-RAP

The Army Research Laboratory Research Associateship Program (ARL-RAP) is designed to significantly increase the involvement of creative and highly trained scientists and engineers from academia and industry in scientific and technical areas of interest and relevance to the Army. Scientists and Engineers at the CCDC Army Research Laboratory (ARL) help shape and execute the Army's program for meeting the challenge of developing technologies that will support Army forces in meeting future operational needs by pursuing scientific research and technological developments in diverse fields such as: applied mathematics, atmospheric characterization, simulation and human modeling, digital/optical signal

processing, nanotechnology, material science and technology, multifunctional technology, combustion processes, propulsion and flight physics, communication and networking, and computational and information sciences.

About Mechanical Sciences (MS)

Science of novel mechanics, mechanisms, and control to enable manned/unmanned ground and air vehicle concepts.

A complete application includes:

- **Curriculum Vitae or Resume**
- **Three References Forms**
  - An email with a link to the reference form will be available in Zintellect to the applicant upon completion of the on-line application. Please send this email to persons you have selected to complete a reference.
  - References should be from persons familiar with your educational and professional qualifications (include your thesis or dissertation advisor, if applicable)
- **Transcripts**
  - Transcript verifying receipt of degree must be submitted with the application. Student/unofficial copy is acceptable

If selected by an advisor the participant will also be required to write a **research proposal** to submit to the ARL-RAP review panel for :

- Research topic should relate to a specific opportunity at ARL (see Research Areas)
- The objective of the research topic should be clear and have a defined outcome
- Explain the direction you plan to pursue
- Include expected period for completing the study
- Include a brief background such as preparation and motivation for the research
- References of published efforts may be used to improve the proposal

Questions about this opportunity? Please email ARLFellowship@orau.org.

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Master's Degree or Doctoral Degree.
- **Academic Level(s):** Master’s Degree (Journeyman Fellow), Master’s Degree 7+ years (Senior Fellow), Doctoral Degree (Postdoctoral Fellow), Doctoral Degree 5+ years (Senior Fellow), or Faculty.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (2 👁)
  - **Computer, Information, and Data Sciences** (17 👁)

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- **Earth and Geosciences** (21 👁)
- **Engineering** (27 👁)
- **Environmental and Marine Sciences** (14 👁)
- **Life Health and Medical Sciences** (51 👁)
- **Mathematics and Statistics** (11 👁)
- **Physics** (16 👁)
- **Science & Engineering-related** (2 👁)
- **Social and Behavioral Sciences** (29 👁)