

Opportunity Title: Computational Modeling of Narratives & Sense-making from Narratives

Opportunity Reference Code: ARL-C-CISD-300160

Organization DEVCOM Army Research Laboratory

Reference Code ARL-C-CISD-300160

Description About the Research

To understand what is happening in our world, there are two avenues we can turn to: sensors, of all types that collect data about environments of interest, and multimedia news for descriptions of events that concern us. To "connect the dots" and make sense of this data and news stories, both sources of information provide value. The research challenges are to gather and convert these sources into a common computational representation for subsequent natural language description, so that the content can be readily understood by users to support their reasoning and decision making about mission-relevant events.

Consider a robot or drone sent to a remote location too dangerous for a human to explore, as occurs in search and rescue operations. There are limits to how far these devices can travel and how long they can operate before running out of power. In a disaster, they may have limited bandwidth for sending video back to their home base and must instead rely on text messages. The objective of these devices is to report information to a remotely located human teammate, and thus the research challenge is that the devices must examine all of the data they can collect with on-board sensors and determine what is noteworthy to report by text narrative.

Similarly, consider multimedia reporting, where independent news organizations may each provide coverage of the same event on a given day, and yet publish stories with distinct content in the text. Accompanying the text may be photos, video, audio, or graphics, as each of these modalities may offer complementary and possibly redundant information about what has happened. Here, human sense making can be supported by designing a system that can analyze the multitude of documents and report back information to a teammate, and thus the research challenge is that this system must examine all of the reports from difference sources and modalities, and determine what events are worth tracking and reporting by text narrative.

While the data collection by sensors and the news reporting by human journalists are distinct processes---one automated and the other manual--they are often intertwined. The data collected from even just one camera may appear across the internet in multiple news reports, and the news report from even just one source may precipitate reviews of data already collected and set off new data collection by many sources. Thus, the final research challenge is in discovering how these distinct systems can work together to build a common understanding of shared knowledge.

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About CISD

The [Computational and Information Sciences Directorate \(CISD\)](#) conducts research in a variety of disciplines relevant to achieving and implementing the so-called digital battlefield. Problems address the sensing, distribution, analysis, and display of information in the modern battle space. CISD research focuses on four major areas: communications, atmospheric modeling, battlefield visualization, and computing

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.

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

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research

- References of published efforts may be used to improve the proposal

A link to upload the proposal will be provided to the applicant once the advisor has made their selection.

Questions about this opportunity? Please email

ARLFellowship@orau.org.

Point of Contact [ARL](#)

Eligibility • **Degree:** Any degree .

Requirements • **Academic Level(s):** Any academic level.

• **Discipline(s):**

- **Computer, Information, and Data Sciences** ([13](#) 👁)
- **Mathematics and Statistics** ([3](#) 👁)
- **Other Non-Science & Engineering** ([1](#) 👁)
- **Social and Behavioral Sciences** ([2](#) 👁)