

Opportunity Title: Integrated Multimodal Facial Recognition Technologies Fellowship

Opportunity Reference Code: ICPD-2024-26

Organization Office of the Director of National Intelligence (ODNI)

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How to Apply **Create and release your Profile on Zintellect** – Postdoctoral applicants must create an account and complete a profile in the on-line application system. **Please note: your resume/CV may not exceed 3 pages.**

Complete your application – Enter the rest of the information required for the IC Postdoc Program Research Opportunity. The application itself contains detailed instructions for each one of these components: availability, citizenship, transcripts, dissertation abstract, publication and presentation plan, and information about your Research Advisor co-applicant.

Additional information about the IC Postdoctoral Research Fellowship Program is available on the program website located at: <https://orise.orau.gov/icpostdoc/index.html>.

If you have questions, send an email to ICPostdoc@orau.org. Please include the reference code for this opportunity in your email.

Application Deadline 2/28/2024 6:00:00 PM Eastern Time Zone

Description **Research Topic Description, including Problem Statement:**

Facial recognition technology has been a longstanding challenge in the field of computer vision, with existing applications struggling to achieve accuracy in diverse real-world scenarios. Despite recent advances, there remains a need for further research to overcome the limitations of current methods and improve their robustness, particularly in situations where faces are partially occluded, poorly lit, or exhibit varying expressions.

This research topic investigates the use of new models, such as vision transformers, for facial recognition, with a focus on developing techniques to accurately evaluate the confidence of matches and interpret the embedding space. A key limitation of current systems is that they do not scale into downstream use cases as their inaccuracies compound, limiting their applicability. The research might also explore the combination of multiple modalities, such as audio and face recognition, and the incorporation of video data to enhance the accuracy of systems. Finally, the project would examine the potential applications of the developed techniques for other embedding searches, such as sentence embeddings.

Example Approaches:

Proposals are likely to approach this Topic from an applied vision transformers (ViT) perspective. A literature review with respect to facial recognition and recently emerging associated fields could inform experimental work, e.g. AI/ML enhanced ViT, may be relevant.

Relevance to the Intelligence Community:

Facial recognition technology plays a critical role in various NIC applications, including identity verification and counter-surveillance. Advancements in this field may:



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- Develop reliable and lawful capabilities in support of law enforcement, national security and to safeguard sensitive national infrastructure.
- Improve identity verification accuracy to mitigate the well-known short-coming of false positives and racial bias that occur in currently available technology.

The proposed research aims to push the boundaries of what is currently possible, which can potentially lead to breakthroughs in operational effectiveness, legal compliance and efficiency. Furthermore, the exploration of multimodal fusion and video analysis may expand the scope of applicable scenarios, providing valuable insights and tools for the NIC.

Reference:

Zhonglin Sun, Georgios Tzimiropoulos (2022) 'Part-based face recognition with vision transformers', arXiv:2212.00057 [cs. CV],
<https://doi.org/10.48550/arXiv.2212.00057>.

Key Words: facial recognition, vision transformers (ViT), machine learning, video sense-making, real time analysis, video multimodal fusion.

Qualifications **Postdoc Eligibility**

- U.S. citizens only
- Ph.D. in a relevant field must be completed before beginning the appointment and within five years of the appointment start date
- Proposal must be associated with an accredited U.S. university, college, or U.S. government laboratory
- Eligible candidates may only receive one award from the IC Postdoctoral Research Fellowship Program

Research Advisor Eligibility

- Must be an employee of an accredited U.S. university, college or U.S. government laboratory
- Are not required to be U.S. citizens

Eligibility **Requirements** **Citizenship:** U.S. Citizen Only

- **Degree:** Doctoral Degree.
- **Discipline(s):**
 - **Chemistry and Materials Sciences** ([12](#) )
 - **Communications and Graphics Design** ([6](#) )
 - **Computer, Information, and Data Sciences** ([17](#) )
 - **Earth and Geosciences** ([21](#) )
 - **Engineering** ([27](#) )
 - **Environmental and Marine Sciences** ([14](#) )
 - **Life Health and Medical Sciences** ([45](#) )
 - **Mathematics and Statistics** ([11](#) )
 - **Other Non-Science & Engineering** ([2](#) )
 - **Physics** ([16](#) )
 - **Science & Engineering-related** ([1](#) )
 - **Social and Behavioral Sciences** ([30](#) )

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