Opportunity Title: Fellowship in Machine Learning/Computer Vision – Close Range Photogrammetry
Opportunity Reference Code: NGA-2021-0025

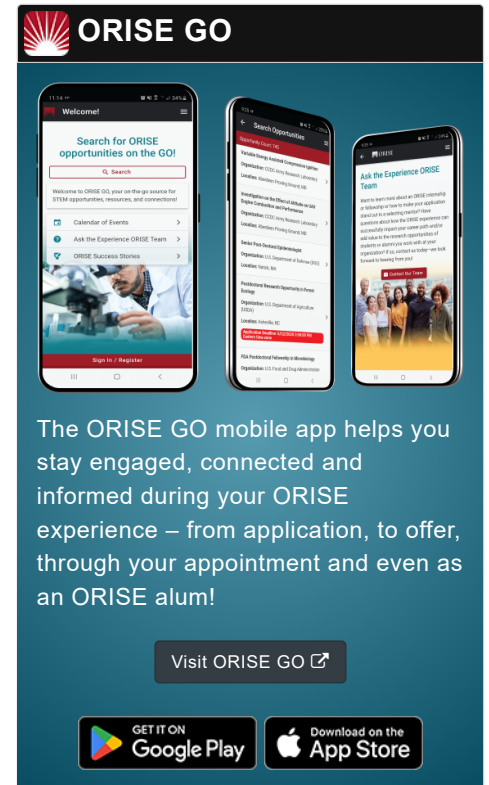|	
Organization	U.S. Department of Defense (DOD)
Reference Code	NGA-2021-0025
How to Apply	Click on *Apply* at the bottom of the opportunity to start your application.
Application Deadline	6/11/2021 11:59:00 PM Eastern Time Zone
Description	The Department of Defense (DoD) is offering a postdoctoral fellowship for their Visiting Scientist Program at the National Geospatial-Intelligence Agency (NGA), a world leader in timely, relevant, accurate and actionable GEOINT.

What will I be doing?

With the omnipresence of high quality images available via the internet and social media, high resolution photographs from US - denied corners of the world are available like never before. Oftentimes, these images contain objects of very high interest and intelligence value. But, unlike highly calibrated space-borne and aerial cameras whose image metadata contains sensor position, orientation, calibration characteristics, etc., photographs harvested from personal devices and the internet are absent such metadata – metadata required for accurate photogrammetric exploitation of objects displayed within the image scene.

Even though images harvested from non-metric (unknown) sources typically display very high resolution quality, the process of obtaining accurate dimensions of objects depicted in those images is oftentimes immensely difficult and frequently unfruitful. This is partly attributed to the absence of sensor/lens data, sensor orientation and geolocation, and image cropping (non-full frame images). Additional constraints are presented by the absence of multiple images containing the object(s) of interest, i.e. only a single image being available, and finding object(s) of known size within an image scene, i.e. identifying a known scalar. Lastly, close range images often display perspective foreshortening, and sometimes wide-angle lens distortion, adding additional challenges to photogrammetric exploitation of objects in a scene.

As the selected candidate, you will utilize advances in computer vision and machine learning combined with well-established photogrammetric techniques to derive a camera sensor model from a single or very small-batch of metadata-absent images acquired using consumer grade cameras/mobile devices. The research will involve developing an automated or semi-automated process utilizing learned/recognized common objects, shapes, geometries, and architectural standards present in most

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photographic scenes. The derived sensor model will enable
accurate dimensional analysis of metadata-absent images.

Where will I be located?

You will conduct research remotely under the direction of a
mentor who will be based in Springfield, Virginia.

What is the anticipated start date?

NGA is ready to make appointments immediately. Exact start
dates will be determined at the time of selection and in
coordination with the selected candidate. Applications are
reviewed on an ongoing basis and fellowships will be filled as
qualified candidates are identified.

What is the appointment length?

Appointments are initially for one year with the option to extend
the appointment for up to four additional years, contingent upon
project needs and funding availability.

What are the benefits?

As a participant with NGA, you will receive:

- Stipend, determined by NGA, based on your academic
  credentials and commensurate with GS Locality Pay Tables
- Health Insurance Allowance
- Relocation Allowance, if you are located more than 50 miles
  one way from the hosting facility
- Travel Expense Allowance
- Education and Research Support Allowance

About NGA

The National Geospatial-Intelligence Agency (NGA) delivers
world-class geospatial intelligence that provides a decisive
advantage to policymakers, warfighters, intelligence
professionals, and first responders. Anyone who sails a U.S.
ship, flies a U.S. aircraft, makes national policy decisions, fights
wars, locates, target, responds to natural disasters, or even
navigates with a cellphone relies on NGA. NGA enables all of
these critical actions and shapes decisions that impact our world
through the indispensable discipline of geospatial
intelligence. For more information about NGA, please
visit https://www.nga.mil/.

About ORISE

This program, administered by Oak Ridge Associated
Universities (ORAU) through its contract with the U.S.
Department of Energy (DOE) to manage the Oak Ridge Institute
for Science and Education (ORISE), was established through an
interagency agreement between DOE and DoD. Participants do

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not enter into an employee/employer relationship with ORISE, ORAU, DoD or any other office or agency. Instead, you will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE. For more information, visit the ORISE Research Participation Program at the U.S. Department of Defense.

Qualifications The qualified candidate will have a doctoral degree or be within nine months of completion of that degree. Degree must have been received within five years of the appointment start date. U.S. military veterans who have been honorably discharged (or who have been medically discharged because of a service-connected disability) and who received a doctoral degree within ten years of the desired start date are also eligible.

Highly competitive applicants will have:

- A background in computer vision, machine learning or other relevant discipline.
- Experience in the application of the scientific method.
- A background in modern research techniques in a field highly related to the GEOINT Research.
- Experience in conceptualizing a broad research agenda and in planning and executing specific research projects.
- Knowledge of scientific computing/scripting languages such as Python.
- Experience working with remote sensing and geographic data.
- Ability to integrate with large data repositories.
- A background in high-performance computing.

U.S. citizenship is required.

Application Requirements

A complete application consists of:

- Zintellect Profile
- Educational and Employment History
- Essay Questions (goals, experiences, and skills relevant to the opportunity)
- Resume (PDF)
- Transcripts/Academic Records - For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. Click here for detailed information about acceptable transcripts.
- 2 Recommendation(s)

Submitted documents must have all social security numbers, student identification numbers, and/or dates of birth removed

*(blanked out, blackened out, made illegible, etc.) prior to
uploading into the application system. All documents must be in
English or include an official English translation.*

If you have questions, send an email to
orisedod@orise.orau.gov. Please list the reference code of this
opportunity [NGA-2021-0025] in the subject line of the email.

Connect with ORISE...on the GO! Download the new ORISE
GO mobile app in the Apple App Store or Google Play Store to
help you stay engaged, connected, and informed during your
ORISE experience and beyond!

Eligibility Requirements	- **Citizenship:** U.S. Citizen Only
	- **Degree:** Doctoral Degree received within the last 60 months or anticipated to be received by 1/31/2022 11:59:59 PM.
	- **Discipline(s):**
	  ○ **Chemistry and Materials Sciences** (12 👁)
	  ○ **Communications and Graphics Design** (2 👁)
	  ○ **Computer, Information, and Data Sciences** (17 👁)
	  ○ **Earth and Geosciences** (21 👁)
	  ○ **Engineering** (27 👁)
	  ○ **Environmental and Marine Sciences** (14 👁)
	  ○ **Life Health and Medical Sciences** (46 👁)
	  ○ **Mathematics and Statistics** (10 👁)
	  ○ **Physics** (16 👁)
	  ○ **Science & Engineering-related** (1 👁)
	  ○ **Social and Behavioral Sciences** (28 👁)
	- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).