

Opportunity Title: Measuring and attributing variation within major crop types over large regions

Opportunity Reference Code: IC-18-17

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 2 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://orau.org/icpostdoc/>.

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

Application Deadline 3/12/2018 11:59:00 AM Eastern Time Zone

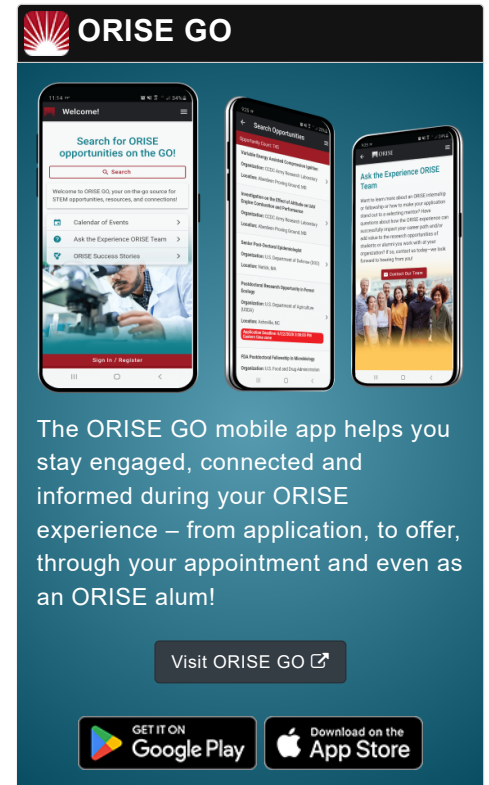
Description **Research Topic Description, including Problem Statement:**

The goal of this research is to support early warning of food security issues by improving regional and global crop classification from remotely sensed data. Because of the global scale of modern agriculture, a limited number of crop types (e.g., wheat, barley, corn, soy, rice) dominate the world's food supply. Within each type, however, these crops vary widely due to different cultivars, growing conditions, and management practices. This variation makes it difficult to construct the representative ground truth data required for accurate and automated regional or global crop classification. Currently, crop classification training data are highly localized and limited in distribution which can result in poorly captured variance of a crop across larger spatial scales. There is a need for research into how each crop type can vary across space and how to optimally sample training and testing data across different regions, climatological regimes, and topographic conditions in order to improve regional and global crop classification from remotely sensed data.

Example Approaches:

Example approaches could include, but are in no way limited to:

- Using data mining and clustering approaches to separate



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widely distributed regional samples into unlabeled classes, interpreting the differences between such clusters, and determining geophysical, biological, and anthropogenic drivers of those differences.

- Combining multiple data sources to determine driving conditions of variation and modeling how a priori conditions can forecast crop “appearance” (e.g., phenological state at a given time, field pattern, normalized difference vegetation index response) from remote sensing data (e.g., synthetic aperture radar, multispectral).
- Using remotely sensed data in conjunction with field samples to determine how small scale variations coalesce as larger regional patterns for different crop types.
- Developing methods to estimate how a crop in a specific region or locale might vary from generalized spectral, spatial, or temporal signatures.

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 application deadline
- 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** (16 )
 - **Earth and Geosciences** (21 )
 - **Engineering** (27 )
 - **Environmental and Marine Sciences** (14 )
 - **Life Health and Medical Sciences** (45 )
 - **Mathematics and Statistics** (10 )
 - **Other Non-Science & Engineering** (5 )
 - **Physics** (16 )
 - **Science & Engineering-related** (1 )
 - **Social and Behavioral Sciences** (28 )

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