Opportunity Title: Building Mapping
Opportunity Reference Code: IC-16-50

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.

Application Deadline 4/15/2016 6:00:00 PM Eastern Time Zone

Description The principal aim of the research is to develop techniques which can be used map a building and identify and enumerate occupants from outside of the building. It should be assumed that access to the inside of the building is not possible and that there is no prior knowledge of the structure and layout of the building. Approaches should work at stand off from the building if possible. This is a hard problem in general because of absorption and reflection of both longitudinal and transverse waves by the building fabric.

There is exiting research in the following areas which should be considered when developing a proposal:

- radio frequency techniques (e.g., correction of multi-path transmissions at longer wavelengths)
- active radar techniques
- acoustic sensing
- passive electromagnetic sensing
- gravitational and magnetic sensing
- quantum sensing
- optics and photonics
- material science of transmission of waves through buildings

Example Approaches:

There is no specific limitation on the techniques used for this topic, but it is anticipated that research will fall in the area of remote sensing techniques, including but not limited to physical fields (electric, gravitational, magnetic), radio frequency engineering, optics and photonics. The research could also consider techniques for analyzing data from sensors to integrate the results of the sensing. Modeling and simulation techniques could be developed, as well as experimental trials and the development of prototypes.

Research questions to consider and address are:

- What is the impact of building materials and environmental conditions on the accuracy of remote sensing techniques?

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- Is there an optimal combination of remote sensing techniques to allow object identification through walls?
- Is super-resolution possible at low wavelengths through walls?
- How can data fusion from sensors address confidence in object identification in a building environment?

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Business** (11)
  - **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** (13)
  - **Physics** (16)
  - **Science & Engineering-related** (1)
  - **Social and Behavioral Sciences** (28)