Opportunity Title: Extension of Matrix Signal Demodulation Techniques to Allow Combining Multiple Samples
Opportunity Reference Code: IC-16-28

Organization	Office of the Director of National Intelligence (ODNI)
Reference Code	IC-16-28
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	Research is needed in order to develop new techniques that extend the concepts of single channel demodulation of multiple simultaneous signals to include the case where there are multiple samples of the signal(s) of interest against different backgrounds. These samples are obtained by having multiple overlapping high-gain antenna patterns which each include the signal(s) of interest but include different backgrounds of noise and signals not of interest.

The goal of this effort is to explore techniques for optimizing the samples to be collected such that the best SNR is maintained while satisfying other performance criteria.
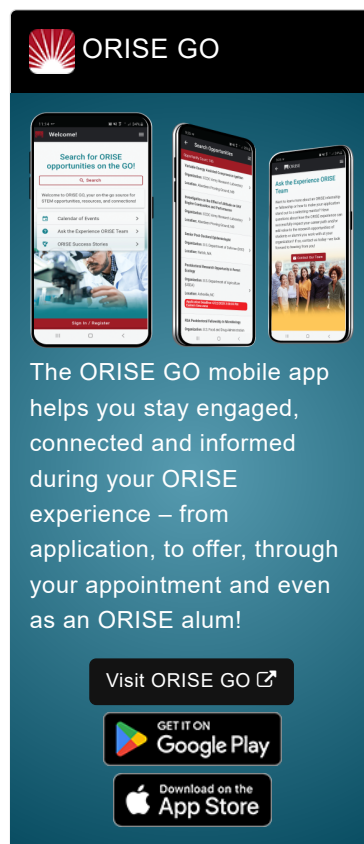
Example Approaches

Proposals could explore optimal properties of the samples of Signal/Demodulatable Signals Not Of Interest/Noise as represented by solid angles that overlap to different degrees.

Proposals could also consider approaches to extend the existing single channel techniques (such as matrix demodulation, parallel interference cancellation and successive interference cancellation) to multiple channels that are partially correlated. Attention should be placed on either realistic computational approaches that demonstrate the expansion of the state of the art in this area, or on improving the theoretical understanding of simultaneous multi-signal demodulation from a purely mathematical or communications theory perspective.

Proposals focusing on experimentation/demonstration will be provided synthetically generated data sets as requested.

Eligibility Requirements	- **Citizenship:** U.S. Citizen Only
	- **Degree:** Doctoral Degree.
	- **Discipline(s):**
	    - **Business** (11 👁)
	    - **Chemistry and Materials Sciences** (12 👁)

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- **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](#) 👁)