PARTNERSHIPS BETWEEN SCIENCE AND ENGINEERING FIELDS AND THE NSF TRIPODS INSTITUTES *(TRIPODS+X)*

WEBINAR: March 20, 2018

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505527

AGENDA

- Welcome from Directorate Leadership
  - **Deborah Lockhart (MPS)**
  - **James Kurose (CISE)**
- Overview of Program
  - **Nandini Kannan (DMS)**
- Solicitation Specific Requirements & Review Criteria
  - **Tracy Kimbrel (CCF)**
- TRIPODS+X NSF Directorates/Divisions
  - **Rahul Shah (CCF)**
- TRIPODS Institute contacts
  - **Christopher Stark (DMS)**
- Q&A

TRIPODS OVERVIEW

Transdisciplinary Research in Principles of Data Science

- Collaboration between the **Division of Mathematical Sciences (DMS)** in the Directorate for Mathematical and Physical Sciences (MPS) and the **Division of Computing and Communication Foundations (CCF)** in the Directorate for Computer & Information Science & Engineering (CISE)
- Addresses two of NSF's 10 Big Ideas
  - **"Harnessing Data for 21st Century Science and Engineering"**
  - **"Growing Convergent Research at NSF"**
- Focuses on the theoretical foundations of data science, --**core algorithmic, mathematical, and statistical principles**.

HARNESSING THE DATA REVOLUTION (HDR) THEMES AND TRIPODS

I. **Fundamental research in data-centric mathematics, statistics and computer science**
II. **Fundamental research of data-centric algorithms** and **systems**
III. **Data-driven research in all research domains**
IV. Development of a robust, comprehensive, open, science-driven research cyberinfrastructure ecosystem
V. **Creation of a 21st century data-capable workforce**

- **TRIPODS**
- **TRIPODS + X**
- **BOTH**

TRIPODS GOAL

Transdisciplinary Research In Principles Of Data Science (TRIPODS) aims to bring together communities from **statistics, mathematics, and theoretical computer science** to develop the **theoretical foundations of data science** through institutes for **integrated research and training activities**.

TRIPODS PHASE I

- **12 Small Collaborative Phase I Institutes pursuing fundamental research and training** in the theoretical foundations of data science, including significant involvement of all three communities. **Awards are approximately $1.5M for three years.**
- **Developing capacity** toward **full-scale activities** for full Institute operations by operating as smaller Institutes
  - workshops
  - training of students & post doctoral fellows
  - workforce development
  - community building

TRIPODS + X

- Expands scope beyond data science foundations engaging researchers across other disciplines
- **Data-driven research and education challenges motivated by applications**
- Other activities aimed at building robust data science communities

PROGRAM HIGHLIGHTS, PROPOSAL PREPARATION, & REVIEW CRITERIA

TRIPODS + X TRACKS

- **Education Track**
  - up to $200,000
  - any or all educational levels
- **Research Track**
  - up to $600,000
  - “research value” on both sides
- **Visioning Track**
  - up to $200,000
  - community-building and direction-setting

TRIPODS + X TEAM REQUIREMENTS

- One PI or co-PI **must represent a discipline other than the three TRIPODS disciplines** (mathematics, statistics, and theoretical computer science).
- One PI or co-PI **must be a member of one of the 12 TRIPODS teams**.

PROPOSAL PREPARATION GUIDELINES

Required Elements (in addition to the requirements listed in the PAPPG NSF 18-1)

- **Full proposals**: due May 29, 2018
- **Required: Project Coordination Plan**
  - Roles including expertise in "**X**" discipline
  - Plans for collaboration and coordination
  - Timeline
- **Required: letter from lead TRIPODS PI**

PROPOSAL PREPARATION GUIDELINES

Project Description

- For proposals submitted to the Visioning Track, the project description **should not exceed 8 pages.**
- For Research and Education Track projects, the **standard 15-page limits apply**

SOLICITATION SPECIFIC REVIEW CRITERIA

Convergence/Synergy

- Domain scientists and engineers and data science foundations researchers
- Emerging data-driven research challenges and/or educational needs
- Synergy between the groups
- Potential for intellectual merit on both sides

SOLICITATION SPECIFIC REVIEW CRITERIA

Quality and Value of Collaboration

- Project expertise is **complementary, and well-suited** to the research and training programs
- **Specific roles** of each collaborating investigator are made clear
- **Collective team's expertise**

NSF ORGANIZATIONS, CONTACTS, AND AREAS OF INTEREST

PARTICIPATING NSF ORGANIZATIONS

- **Directorate for Mathematical & Physical Sciences (MPS)**
  - Division of Mathematical Sciences (DMS)
  - Division of Astronomical Sciences (AST)
  - Division of Chemistry (CHE)
  - Division of Materials Research (DMR)

- **Directorate for Computer & Information Science & Engineering (CISE)**
  - Division of Computing and Communication Foundations (CCF)
  - Division of Information & Intelligent Systems (CNS)
  - Division of Computer and Network Systems (IIS)

- **Directorate for Engineering (ENG)**
  - Division of Civil, Mechanical and Manufacturing Innovation (CMMI)
  - Engineering Education and Centers (EEC)

PARTICIPATING NSF ORGANIZATIONS

- **Directorate for Geosciences (GEO)**
  - Division of Atmospheric and Geospace Sciences (AGS)
  - Division of Earth Sciences (EAR)
  - Division of Ocean Sciences (OCE)
  - Office of Polar Programs (OPP)
- **Directorate for Social, Behavioral & Economic Sciences (SBE)**
  - Division of Social and Economic Sciences (SES)
- **Office of Integrative Activities** (OIA)

NSF TRIPODS PROGRAM DIRECTORS MPS/DMS AND CISE/CCF

- Nandini Kannan, Program Director, Division of Mathematical Sciences (DMS), telephone: (703) 292-8104, email: nakannan@nsf.gov
- Tracy Kimbrel, Program Director, Division of Computing and Communication Foundations (CCF), telephone: (703) 292-8910, email: tkimbrel@nsf.gov
- Rahul Shah, Program Director, CCF, telephone: (703) 292-8910, email: rshah@nsf.gov
- Christopher W. Stark, Program Director, DMS, telephone: (703) 292-4869, email: cstark@nsf.gov
- tripods@nsf.gov to reach all four

DIVISION OF ASTRONOMICAL SCIENCES MPS/AST

Nigel Sharp, nsharp@nsf.gov

- AST is interested in all projects that will engage foundational data scientists with astronomers to meet the need for access to and analysis of astronomical data of increasing size and complexity.
- In particular, priority is likely to be given to work that:
  - builds on existing efforts, such as the protocols and middleware of the Virtual Astronomical Observatory (VAO), or
  - promises to enhance and extend user-friendly interfaces using the principles of Human-Computer Interaction (HCI), or
  - supports the haphazardly accumulating long tail of value-added smaller data sets, or
  - could lead to standardized access to diverse datasets not necessarily uniformly stored or described, or
  - works towards tools that ease the path to Multi-Messenger Astrophysics (MMA), or
  - offers innovative handling of real-time data streams for rapid response or data sieve applications, or
  - aims at any combination of these goals.

DIVISION OF CHEMISTRY, MPS/CHE

Lin He, lhe@nsf.gov

- **CHE is particularly interested** in research topics identified in the Dear Colleague Letter NSF 17-112: Data-Driven Discovery Science in Chemistry (D3SC)

- CHE will only support projects submitted to the Research Track.

DIVISION OF MATERIALS RESEARCH, MPS/DMR

Eva M. Campo, ecampo@nsf.gov

- **DMR Areas of Interest**
  - Expanding Foundations to Discover Materials, Matter, and Related Phenomena
  - Potentially transformative research to discover effective data-centric approaches to advance materials research:
    - Materials Synthesis
    - Microstructure-Property relationships
    - Choosing the "optimum" next data point/experiment
  - Invent and develop best data analytics tools for materials research
  - Interact with DMR projects
    - DMR Centers and facilities
    - Partnerships for Research and Education in Materials (PREMs)
    - Designing Materials to Revolutionize and Engineer our Future (DMREF)
  - Join/Support emerging Materials Research Data Resource Network

DIVISION OF COMPUTER AND NETWORK SYSTEMS CISE/CNS

Darleen Fisher, dlfisher@nsf.gov

- computer system reliability and vulnerability
- resource orchestration in distributed systems
- knowledge base for compiler optimization
- middleware, operating system optimizations for system throughput
- analytics over system inputs for system design and system operations
- security assessment, prediction, and enhancement
  - behaviors of systems and individuals, organizations, and (social) networks
- network optimization
- soft fault localization, anomaly detection and outage prevention
- combined analytics/physical models for channel optimization
- cross-layer network optimization
- combined ML and model-based techniques
  - channel estimation; link-layer control; hand-off in cellular systems.

DIVISION OF INFORMATION AND INTELLIGENT SYSTEMS, CISE/IIS

Aidong Zhang, azhang@nsf.gov

- Data Mining
- Machine Learning
- Data Integration, Fusion, and Management
- Data Modeling
- Data Visualization and Virtual Reality
- Data Science on Biological and Biomedical Data
- Data Science on Electronic Health Record Data
- Data Access, Privacy and Security
- Situation-aware Computing

DIVISION OF CIVIL, MECHANICAL AND MANUFACTURING INNOVATION, ENG/CMMI

Alexis Lewis, alewis@nsf.gov

- Manufacturing and Materials
- Natural Hazards
- Transportation
- Energy/Smart Grid

ENGINEERING EDUCATION AND CENTERS ENG/EEC

Eduardo Misawa, emisawa@nsf.gov

- Stimulate further advances in Engineering Research Centers (ERC) projects through productive collaborations with data scientists working on foundational data science in TRIPODS institutes

DIRECTORATE FOR GEOSCIENCES, GEO

Eva Zanzerkia, ezanzerk@nsf.gov

- The **Office of Polar Programs (OPP)**: interdisciplinary research that focuses on how the components of the polar regions (land, atmosphere, ocean, sea and land ice, etc.) interact as a system, with feedbacks and unanticipated emergent properties. The Program also welcomes proposals related to polar astrophysics and geospace research.
- The **Division of Atmospheric and Geospace Sciences** (AGS): fundamental science questions related to atmospheric and geospace research, including a wide variety of important processes that impact humans and society, such as space weather, tropospheric weather, physical & dynamic meteorology, climate, and air quality.
- The **Division of Earth Sciences (EAR)**: structure, composition, and evolution of the Earth, the interaction with life, and the processes that govern the formation and behavior of the Earth's materials. Earth Sciences interests includes the fields of "solid-earth" science (geology and paleontology, geochemistry, geophysics, continental hydrology, geomorphology, tectonics and geobiology.).
- The **Division of Ocean Sciences (OCE)**: advance understanding of all aspects of the global oceans and ocean basins, including their interactions with people and the integrated Earth system.

DIVISION OF SOCIAL AND ECONOMIC SCIENCES SBE/SES

Kenneth C. Land, kland@nsf.gov

- Social Networks – Structures and Dynamics
- Health Related Data and Outcomes
- Cybercrimes
- Economic Transactions and Mechanisms
- Public Opinion Formation and Manipulation

TRIPODS INSTITUTES AND CONTACTS

TRIPODS PHASE I INSTITUTES

WEBSITE: nsf-tripods.org

- UA-TRIPODS: Building Theoretical Foundations for Data Sciences, **University of Arizona**
- Foundations of Model Driven Discovery from Massive Data, **Brown University**
- Berkeley Institute on the Foundations of Data Analysis, **University of California, Berkeley**
- TRIPODS: Towards a Unified Theory of Structure, Incompleteness and Uncertainty in Heterogeneous Graphs, **University of California, Santa Cruz**
- From Foundations to Practice of Data Science and Back, **Columbia University**
- TRIPODS: Data Science for Improved Decision-Making: Learning in the Context of Uncertainty, Causality, Privacy, and Network Structures, **Cornell University**

TRIPODS PHASE I INSTITUTES

- Transdisciplinary Research Institute for Advancing Data Science (TRIAD), **Georgia Institute of Technology**
- Collaborative Research: TRIPODS Institute for Optimization and Learning, **Lehigh University, Northwestern University, State University of New York at Stony Brook**
- Institute for Foundations of Data Science (IFDS), **Massachusetts Institute of Technology**
- Topology, Geometry, and Data Analysis (TGDA@OSU): Discovering Structure, Shape, and Dynamics in Data, **The Ohio State University**
- Algorithms for Data Science: Complexity, Scalability, and Robustness, **University of Washington**
- Institute for Foundations of Data Science, **University of Wisconsin-Madison**

UA-TRIPODS
UNIVERSITY OF ARIZONA

- **Foundational topics**
  - machine learning, optimization, natural language processing, imaging science, dynamical systems
  - dimensionality reduction, large-scale networks and graphs, theory of data visualization and interpretation
  - Bayes methods for big data
- **Fields of Interest/Research Topics**
  - astronomy, planetary sciences, optical sciences, LSST
  - earth sciences-geoscience, atmospheric,ocean sciences
  - life sciences – systems biology, genomics
  - medical sciences-precision medicine, health informatics

UA-TRIPODS
UNIVERSITY OF ARIZONA

- Lead PI: Helen Zhang (Statistics), hzhang@math.arizona.edu
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- Other Points of Contact
  - Stephen Kobourov (Computer Science), kobourov@cs.arizona.edu
  - David Glickenstein (Mathematics), glickenstein@math.arizona.edu
  - Joe Watkins (Mathematics/Statistics), jwatkins@math.arizona.edu

BROWN DATA SCIENCE INITIATIVE
BROWN UNIVERSITY

- **Foundational topics**
  - Foundations of Model-Driven Discovery from Massive Data
  - Causality and Causal Inference
  - Graphs and Networks
  - Geometric and Topological Methods in Data Analysis
- **Fields of Interest/Research Topics**
  - Medical image analysis
  - Inferring structure of large networks from samples
  - Causal structures in networks, e.g. gene regulatory networks, HIV transmission

BROWN DATA SCIENCE INITIATIVE
BROWN UNIVERSITY

- Lead PI: Jeffrey Brock; jeff_brock@brown.edu; math
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- Other Points of Contact
  - Björn Sandstede; bjorn_sandstede@brown.edu; applied math
  - Joseph Hogan; jhogan@stat.brown.edu; biostatistics
  - Stuart Geman; stuart_geman@brown.edu; applied math
  - Eli Upfal; eli@cs.brown.edu; algorithms

FODA (FOUNDATIONS OF DATA ANALYSIS) UC BERKELEY

- **Foundational topics**
  - Algorithms, inference, and fundamental tradeoffs
  - Stability as a computational-inferential principle
  - Data-driven computational mathematics

- **Fields of Interest/Research Topics**
  - Combining science-based models with data-driven models
  - Astronomy/cosmology
  - Genetics and medical imaging
  - Social sciences

FODA (FOUNDATIONS OF DATA ANALYSIS) UC BERKELEY

- Lead PI: Michael Mahoney; mmahoney@stat.berkeley.edu; applied mathematics, statistics, computer science
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  - Bin Yu; binyu@berkeley.edu; statistics
  - Fernando Perez; fernando.perez@berkeley.edu; physics, statistics, applied mathematics
  - Richard Karp; richardkarp@berkeley.edu; computer science
  - Michael Jordan; jordan@cs.berkeley.edu; computer science, statistics

TOWARDS A UNIFIED THEORY OF STRUCTURE, INCOMPLETENESS & UNCERTAINTY IN HETEROGENEOUS GRAPHS - UC SANTA CRUZ

- **Foundational topics**
  - Statistical models for graphs
  - Randomized algorithms
  - Stochastic processes
- **Fields of Interest/Research Topics**
  - Astronomy
  - Biology
  - Social science
  - Privacy, Interpretability & Fairness
  - Physical Sciences

TOWARDS A UNIFIED THEORY OF STRUCTURE, INCOMPLETENESS & UNCERTAINTY IN HETEROGENEOUS GRAPHS - UC SANTA CRUZ

- Lead PI: Lise Getoor; getoor@ucsc.edu; ML & AI
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  - Dimitris Achlioptas; dachliop@ucsc.edu; algorithms
  - Abhradeep Guha Thakurta; aguhatha@ucsc.edu; privacy & ML
  - Rajarshi Guhaniyogi; rguhaniy@ucsc.edu; statistics
  - Daniele Venturi; venturi@ucsc.edu applied mathematics

COLUMBIA UNIVERSITY TRIPODS INSTITUTE COLUMBIA (CENTER FOR FOUNDATIONS OF DATA SCIENCE)

- **Foundational topics**
  - Nonconvex Optimization
  - Interactive Protocols for Learning
  - Primitives for Efficient Computation
- **Fields of Interest/Research Topics**
  - Physical sciences:
    - Astronomy, Chemistry, Materials
  - Sensing and Imaging
  - Health
  - Smart Cities

COLUMBIA UNIVERSITY TRIPODS INSTITUTE COLUMBIA (CENTER FOR FOUNDATIONS OF DATA SCIENCE)

- Lead PI: **John Wright**; jw2966@ee.columbia.edu; math, algorithms
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- Other Points of Contact
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  - **David Blei**; david.blei@columbia.edu; statistics, algorithms
  - **Qiang Du**; qd2125@columbia.edu; mathematics
  - **Daniel Hsu**; daniel.hsu@columbia.edu; algorithms, statistics

CORNELL CENTER OF DATA SCIENCE FOR IMPROVED DECISION-MAKING CORNELL UNIVERSITY

- **Foundations Topics**
  - Optimization, Statistics
  - Counterfactual Inference
  - Causality
- **Fields of Interest/Research Topic**
  - Social Science
  - Biology
  - Robotics

CORNELL CENTER OF DATA SCIENCE FOR IMPROVED DECISION-MAKING CORNELL UNIVERSITY

- Lead PI: Kilian Weinberger, kqw4@cornell.edu, Machine Learning
- Website: http://tripods.cis.cornell.edu

- Other Points of Contact
  - Jon Kleinberg, kleinber@cs.cornell.edu, CS Theory
  - David B. Shmoys, david.shmoys@cornell.edu, Optimization
  - Giles J. Hooker, gjh27@cornell.edu, Statistics
  - Steve Strogatz, strogatz@cornell.edu, Mathematics

TRANSDISCIPLINARY RESEARCH INSTITUTE FOR ADVANCING DATA SCIENCE (TRIAD) GEORGIA TECH

- **Foundational topics**
  - Transcribing data with new models and mathematics integrates cutting edge *data-analysis techniques* with *dynamical modeling* methodologies
  - New paradigms of *inference* take into account de-centralized data and scalability of the corresponding algorithms.
  - Efficient strategies with theoretical guarantees
- **Fields of Interest/Research Topics**
  - engineering
  - materials science
  - biology
  - and many more…

TRANSDISCIPLINARY RESEARCH INSTITUTE FOR ADVANCING DATA SCIENCE (TRIAD) GEORGIA TECH

- Lead PI: Xiaoming Huo; huo@gatech.edu; statistics
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  - Srinivas Aluru; aluru@cc.gatech.edu; computational science
  - Dana Randall; randall@cc.gatech.edu; algorithms
  - Prasad Tetali; tetali@math.gatech.edu; math and combinatorics
  - Jeff Wu; jeff.wu@isye.gatech.edu; statistics

TRIPODS INSTITUTE FOR OPTIMIZATION AND LEARNING LEHIGH UNIVERSITY, SUNY STONY BROOK, NORTHWESTERN UNIVERSITY

- Foundational topics
  - Stochastic, chance-constrained and black-box optimization.
  - scalable algorithms for training large scale dnn, distributed computing
  - interplay between optimization and generalization, parameter-free approaches.
- Fields of Interest/Research Topics (examples of current projects)
  - Bioinformatics, protein alignment.
  - Applications of DNN and ML in
    - civil engineering (structural stability prediction)
    - chemical engineering
    - supply chain
    - renewable energy
    - physics and spectroscopy
  - Reinforcement learning and robotics,
  - Computer vision.

TRIPODS INSTITUTE FOR OPTIMIZATION AND LEARNING LEHIGH UNIVERSITY, SUNY STONY BROOK, NORTHWESTERN UNIVERSITY

- Lead PI: Katya Scheinberg; katyas@lehigh.edu; computational mathematics, algorithms, optimization.
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  - Frank Curtis; fec309@lehigh.edu; computational mathematics, algorithms, optimization.
  - Martin Takac; mat614@lehigh.edu; algorithms, high performance computing, optimization.
  - Francesco Orabona; francesco@cs.stonybrook.edu; learning theory, algorithms
  - Han Liu; hanliu@northwestern.edu; statistics, learning

MIT INSTITUTE FOR FOUNDATIONS OF DATA SCIENCE
MASSACHUSETTS INST. OF TECHNOLOGY

- **Foundational topics**
  - Machine learning
  - Efficient algorithms
- **Fields of Interest/Research Topics**
  - Biology
  - Computer Networks
  - Health
  - Social Sciences

MIT INSTITUTE FOR FOUNDATIONS OF DATA SCIENCE
MASSACHUSETTS INST. OF TECHNOLOGY

- Lead PI: Piotr Indyk; indyk@mit.edu; algorithms
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  - Devavrat Shah; devavrat@gmail.com; statistics/algorithms

TGDA@OSU NSF TRIPODS CENTER
The OHIO STATE UNIVERSITY

- **Foundational topics**
  - Topological data analysis
  - Stochastic topology and topological statistical mechanics
  - Geometric Processing

- **Fields of Interest/Research Topics**
  - Materials Science
  - Social Science
  - Biology
  - Geometric Modeling
  - Geoscience

TGDA@OSU NSF TRIPODS CENTER
The OHIO STATE UNIVERSITY

- Lead PI: Tamal Dey; dey.8@osu.edu; Computer Science
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  - Yusu Wang; yusu@cse.ohio-state.edu; Computer Science
  - Facundo Memoli; memoli@math.osu.edu; Mathematics

ALGORITHMIC FOUNDATIONS OF DATA SCIENCE INSTITUTE (ADSI) UNIVERSITY OF WASHINGTON

- **Foundational topics**
  - Machine learning
  - Optimization theory and algorithms
  - Complexity and robustness

- **Fields of Interest/Research Topics**
  - Oceanography
  - Robotics
  - Earth Sciences
  - Other areas leveraging the UW eScience Institute

ALGORITHMIC FOUNDATIONS OF DATA SCIENCE INSTITUTE (ADSI) UNIVERSITY OF WASHINGTON

- Co-Lead PI: Maryam Fazel; mfazel@uw.edu; EE/Math
- Co-Lead PI: Sham Kakade; shamk@uw.edu; CS/Stats
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  - Zaid Harchaoui; zaid@uw.edu; Statistics
  - Yin-Tat Lee; yintat@uw.edu; TCS

INSTITUTE FOR FOUNDATIONS OF DATA SCIENCE (IFDS) @ U WISCONSIN-MADISON

- **Foundational topics**
  - Machine learning, theoretical CS, optimization
  - Mathematics
  - Statistics
- **Fields of Interest/Research Topics**
  - Cognitive neuroscience, cognitive psychology
  - Network science
  - Medical imaging
  - Control systems, model predictive control
  - Astronomy
  - Power systems
  - Biochemistry
  - Protein and Genome Science
  - Materials Science
  - Atmospheric Science and Data Assimilation
  - Natural Language Processing
  - Evolutionary biology
  - Computer Vision

INSTITUTE FOR FOUNDATIONS OF DATA SCIENCE (IFDS) @ U WISCONSIN-MADISON

- Lead PI: Steve Wright; swright@cs.wisc.edu; optimization
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  - Rob Nowak; rdnowak@wisc.edu; machine learning, statistics
  - Sebastien Roch; roch@math.wisc.edu; mathematics, networks, applied probability
  - Rebecca Willett; rmwillett@wisc.edu; machine learning, information theory
  - …Plus 12 other senior personnel

QUESTIONS?

Q&A 1

- Q. Are there limits on the number of proposals submitted by PIs or institutions?

- A. There are no per-institution limits. The only limits are on the 12 teams of the current TRIPODS awards. Each team is limited to 5 proposals, with at most 3 in any one track.

Q&A 2

- Q. Many, but not all divisions of NSF are listed as participating in TRIPODS + X. Does this imply that some areas are out of scope?

- A. All areas of research supported by NSF are welcome. Areas traditionally supported by the listed organizations will receive priority consideration.

Q&A 3

- Q. Can the “X” (co-)PI be a computer scientist?

- A. Yes. Note that the Division of Computer and Networhttps://www.nsf.gov/events/event_summ.jsp?cntn_id=244739k Systems (CNS) and Division of Information and Intelligent Systems (IIS) are participating in TRIPODS+X.

TRIPODS + X LINKS

- Program page: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505527
- Webinar page: https://www.nsf.gov/events/event_summ.jsp?cntn_id=244739
- Search engine query: "NSF TRIPODS+X webinar"