Emerging Areas of Research (EAR)
Funding Program

Town Hall Meeting
April 17, 2017
An annual event, just like Little 5…

The start…
RFP released April 10

Turn 1…
Town Hall April 17
Emerging Areas of Research Town Hall Meeting, April 17, 2017

• Key part of a collection of strategic research initiatives

• IU System-Wide:
  o Grand Challenges
  o New Frontiers

• IU Bloomington:
  o Arts & Humanities Council
  o Emerging Areas of Research
  o Strategic Research Investments

• Research at all scales
Emerging Areas of Research Town Hall Meeting, April 17, 2017

- Key part of a collection of strategic research initiatives

- IU Bloomington: Offices of Provost & Vice Provost for Research
  - Emerging Areas of Research
Emerging Areas of Research (EAR)

- Separate, unique, and distinct from specific Grand Challenge Initiatives; teams not selected for GC funding are welcome to adapt proposal to compete in EAR
- IU Bloomington initiative only & component of IU Bloomington Strategic Plan:
  “Identifying, with our faculty and deans, up to six current or emerging areas of strong research promise over the next five years, characterized by the strength and capacity of current faculty to carry out … with gaps to be filled…”
- Aligns with Bicentennial Strategic Plan (catalyzing research)
Emerging Areas of Research (EAR)

• Seeks to build on existing strengths in key areas of research or creative activity on the IU Bloomington campus that can be novel or established, but in need of support that would establish or increase the stature of the area at IU Bloomington

• Either disciplinary or multidisciplinary research is acceptable; however, EAR program does emphasize collaboration and a team approach
**EAR Program Goals**

- Provide critical, strategic investments to advance emerging areas of research based on IU Bloomington strengths
- Improve the ability of IU Bloomington faculty to compete successfully for ambitious and diverse external research support, appropriate to the field, and if applicable potentially create intellectual property with commercialization possibilities
- Facilitate collaborations that enable faculty to pool intellectual input and leverage resources to maximize pursuit of emerging research that facilitates or promotes campus objectives
Goals (cont’d)

- Identify an area of research where the campus can become more competitive with the addition of key faculty who may fill existing gaps
- Promote faculty to serve as world leaders among peers in a specific area and/or be recognized for identifying and executing a novel approach to disciplinary or interdisciplinary research
- Increase the overall impact of research and creative activity on the campus, e.g., fundamental discoveries, technology development and transfer, community-facing performances and exhibits
- Aligns reasonably with strategic plans of schools/College
Resources

• Per Emerging Area:
  o Hiring: 1 – 3 faculty (i.e., base salary lines) (shared with unit as default model)
  o Cash: ~$3M over four years

• Up to five additional EAR initiatives selected over the next four years

• Typically annual competition, up to 2 initiatives selected per round
Resources

Allowable costs:

- Summer salary, course releases (w/ permission)
- Estimated 50% of start-up costs for new faculty
- Equipment purchases (service contract of 1 year)
- Travel to conferences and meetings with collaborators and partners (max.: $20,000/year)
- Fees associated with using IU Bloomington facilities
- Seminars, colloquia, engagement programs
- Sub-contracts, consultants
- Personnel (research scientists, postdocs, grad students)
Resources

- Remember, the EAR is seed funding, meant to leverage much larger activity in future and for far longer than four years
EAR Recipient First Round 2017
Learning: Machines, Brains, and Children

Proposal available on EAR web pages
Timeline

April 10: Distribution of RFP
April 17: Town Hall Meeting
June 30: Required one-page Abstract due
Sept. 1: Required list of three possible external reviewers due

October 13: Proposals due by 5 pm EST

January 2018: Final decision announced
2nd semester AY17-18: Second-round EAR begins
Eligibility

As PIs:
All tenured and tenure-eligible faculty (including center directors)

Proposals including participation by women and members of underrepresented groups as PIs and team members are especially encouraged.

As team members but not PIs:
• Medical Sciences & Clinical faculty
• Faculty appointments not eligible for tenure
• Emeritus faculty
• Visiting and adjunct faculty members
• Research and staff scientists/scholars
• Postdoctoral research associates
• Team member supervised grad students
Proposal

- Personnel (2 page max)
- Biosketches (3 page max or standard NIH/NSF biosketch)
- Research Plan (15 page max)
  - Introduction – Why is the research emerging? How does IUB rank among its peers in this area of research?
  - Specific Aims
  - Design & Methods
  - Timetable
  - Significance & impact
  - Team Leadership and Collaboration (presentation Linda Smith)
  - Future funding/sustainability
  - New proposed positions
  - IU and external collaborative agreements
  - Metrics & Deliverables
Proposal (cont’d)

- **Budget** (required budget template)
  Notional! Group(s) selected to receive funding will be expected to provide a full, approved budget each year

- **Budget Justification** (5 page max)
  Salaries, materials, equipment, travel, etc.
  New faculty lines: how will person be a key contributor who will make the campus more competitive in attracting external funding and/or provide evidence that shows how his/her activity will enhance research at IU Bloomington?
Proposal (cont’d)

• Letters of Support (2 page limit per letter)
  o One letter from the chair of each academic unit impacted
  o Due by September 1: List of three external experts capable of assessing the significance of the initiative and the likelihood of its success. OVPR will solicit one letter from the list of experts provided and up to two additional letters from external reviewers not included on the list.
  o Concomitant letters that reflect IU and external collaborative arrangements.
  o OVPR will solicit letters from the dean(s). Support letters from deans will be solicited for the top-half ranked proposals only. Allow ample time to discuss with chairs & deans the strength of the initiative, and how it either aligns with the unit’s strategic priorities or is a new strategic direction that merits support.
Review Process

- Two stages
- First stage: two discipline-specific review panels (one STEM, one non-STEM); includes written reviews
  - Evaluated on basis of specific review criteria
  - We will solicit external evaluation letters (teams provide names of 3 possible external reviewers)
- Second stage: multidisciplinary panel, also includes written reviews
  - Proposals evaluated on basis of specific program goals
  - Lead team members for top proposals invited to give presentations
- Provost and Vice Provost for Research make final funding decision together
Review Criteria

- Represents a complex, established or novel, and significant investigation (either discipline-specific or multidisciplinary)
- Strategically addresses an existing strength at IU Bloomington for which a novel approach with addition of resources will make the area world-class among peers or recognized for identifying and executing a novel approach
- Represents strong team-based approach to research and/or creative activity and evaluates scholarly strength of team
- Identifies area of research where campus can become more competitive with the addition of key faculty
Review Criteria (cont’d)

- Serves broader goals of schools/College with addition of key faculty
- Describes feasibility of proposed research or creative activity and impact of research or creative activity
- Outlines well-defined, achievable goals that can be measured quantitatively and qualitatively
- Strategically leverages IU Bloomington’s existing resources and potentially resources outside of the IU community
- Has potential to attract external competitive, philanthropic, corporate, and/or government funding necessary to sustain the area of research or creative activity
OVPR Resources for EAR Proposals

Suite of resources at ovpr.indiana.edu:

- Proposal Preparation Checklist
- Proposal Preparation Timeline
- Information on other resources - UITS, CSR, CEEP, Pivot Database
- Finding external funding opportunities (federal, foundational, corporate)

Consultation:

OVPR leadership and Proposal Development Services available to meet with any individual PI and/or EAR team
After Selection

• Identify potential alternative funding sources
• OVPR and PDS willing to work with all teams for going after external funding; “re-package” for other opportunities

Maintain momentum!
Emerging Areas of Research

REMINDERS

Abstract Deadline: June 30, 2017
Proposal Deadline: October 13, 2017

EAR RFP available for download at ovpr.indiana.edu/ear
…*not* the Finish Line!

Caitlin Van Kooten, Team Teter, 2011 Little 500 Women’s Race

Just the beginning, as is...
Please Join:
Vice Provost for Research Rick van Kooten
Mayor John Hamilton

Concerned Scientists @ IU
With special guest
Michael Halpern
Center for Science & Democracy, Union of Concerned Scientists

Stand Up for Science!
A Campus-Community Forum

Thursday, April 20, 5:30 – 7:00 PM
Hodge Hall 2075 (Kelley School of Business)
Concerned Scientists @ IU

For additional information, contact concsci@indiana.edu
Follow us on Twitter and Facebook: @CSIUB
Want to join the listserv?
Send email to csiu-l-subscribe@indiana.edu

Marches for Science
Indianapolis, Washington D.C., nationwide
Earth Day, April 22
Writing the EAR: *One Approach*

Learning: Brains, Machines & Children

A internationally recognized emerging area
Already part of the national and international conversation
An already connected team that needed tightening and new additions
A strong record of team science and external funding
The idea:

Learning as the core of advanced intelligence (biological and artificial)

A *national and international emerging area* made possible by advances in large data collection (brain, behavior) and analysis.

Moving beyond toy problems to problems at scale
The idea:

Theoretical and thought papers top journals, federal funding and foundation calls for proposals

**Neuroscientists** (leverage machine learning as hypotheses for brain computation)

**Cognitive scientists** (leverage neuroscience and machine learning to explain human learning)

**Machine learning** (leverage advances in human neuroscience and human learning to find more powerful machine learning algorithms)

*And we are part of this national/international discussion*
1. Self-generated training set
2. Reuse and its developmental consequences
3. Multiple-time scales
4. The brain extends into the world

The Brain-Body-Environment Network

Our unique perspective development and infant learning
The team

Multiple networks of collaborations

A core group had been meeting for a year --
Focusing on these ideas with respect to education
All part of Indiana’s complex systems “brand”

Olaf Sporns
Michael Ryoo
Karin James
Martha White
Chen Yu
Sriram Natarajan
Linda Smith
David Crandall
Franco Pestilli
Michael Jones
Rob Goldstone
David Landy
The team

Multiple networks of collaborations
A core group had been meeting for a year --
  Focusing on these ideas with respect to education
  All part of Indiana’s complex systems “brand”
Other collaborating groups
  Grants & Publications (the added lines)
    multiple collaborative pairs and triples
  Co-sponsored students
  The T32 in Developmental Systems
  The Ostrom Conference (machine and human visual learning) --This May!
Ongoing connected projects
Lots of experience in grants, in team grant, and team science
The New Hires

The people we want to hire are young assistant professors in fields (computational neuroscience, big data developmental science, machine learning linked to human learning and the brain) that did not exist 5 years ago but that are bursting into these disciplines with field-changing discoveries.
Team science

We were not quite a team but almost one
And our growth and connections were organic
Collaboration and Team Science: A Field Guide
Bennett, Gadlin & Levine-Finley, NIH

Enhancing the effectiveness of team science
The National Academies Press
Collaboration and Team Science: A Field Guide

by L. Michelle Bennett, Howard Gadlin, and Samantha Levine-Finley

As modern research methods have become more specialized and the true complexity of today’s most pressing health issues and diseases is revealed, collaborations among scientists trained in different fields have become essential for exploring and tackling these problems. This specialization of research methods has made interdependence, joint ownership, and collective responsibility between and among scientists near requirements. These features of team science may not suit everyone, but given these current trends, it is increasingly likely that most researchers will find themselves asked to participate on or lead a research team at some point in their careers.

As the focus on research teams sharpens, questions are emerging about what constitutes a successful team and how research teams can maximize their effectiveness and experiences. Not every team is successful—some are able to achieve only some of their goals, or fail and dissolve. Other teams are highly successful—reaching and often exceeding their recognized goals and creating positive experiences for team members and the institutions that support them. Why is this the case? What constitutes a successful research team? Why do some research teams succeed while others do not? What factors maximize a research team’s productivity or effectiveness? How can research teams be best recognized, evaluated, and rewarded?

Collaboration and Team Science: A Field Guide was developed to help researchers navigate some of the rocky and murky territory associated with building a team either on their own or at the request of someone in their organization. It is intended for anyone who is currently participating on or leading a research team, considering becoming involved in a research team, or contemplating building a research team.
Two Forms of Trust

**Calculus-Based Trust**

- Characterized by openness, reliability, accountability, dependability, and consistency.
- Established by having processes and procedures in place that guide behavior and actions.
- Expectations are made explicit in written documentation that provides the foundation for communications and data sharing.

**Identification-Based Trust**

- Characterized by similar interests, goals, and objectives that support the shared values.
- Established through positive shared experiences and interactions.
- Over time, team members learn how others behave and interact and, based on these observations and experiences, create their expectations of individual contributions.

(Adapted from Lewicki, 2006.)
The Research Program

**Inputs**
- Hires
- Postdocs
- Grad Students
- Speakers
- Research $

**Activities**
- Research
- Collaborations
- Joint mentoring
- Conference Presentations

**Outputs**
- Papers submitted
- Grants submitted
- Student enrollment

**Short-term Outcomes**
- Increase faculty & PhD students in the EAR
- Papers published
- Grants received
- Mentees placed
- Invited talks

**Mid-term Outcomes**
- New algorithms
- Clear precision predictions about learning
- Recognition a center of excellence

**Long-term Outcomes**
- More complete understanding of learning
- A new field of learning
- More effective education
- Powerful algorithms that learn form the experiences of children

**Measures**
- Experiments started, completed each aim
- Mentoring team meetings
- Seminar speakers invited
- Conference presentations
- Collaborative presentations

**Outputs Measures**
- # funded grants
- collaborative published papers
- # students in EAR

**Short-term Measures**
- # faculty PHD in EAR
- Total $ grants received
- # keynote and invited talks
- Citation counts

**Mid-term Measures**
- Awards Participation national/ international research communities

**Long-term Measures**
- Trends in national research (by key works)
- A theory of learning Educational initiatives based on learning principles
Questions?

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