

NSF Partnerships:

A brief overview and a focus on public-private partnerships

July 2019 NSB Meeting

Jim Kurose

Computer and Information Science and Engineering (CISE)

On behalf of:

All NSF Directorates and Offices

Renewing NSF Steering Group and Partnerships Goal Team

NSF Partnerships Agency Priority Goal Team

With:

Dawn Tilbury, Assistant Director, Engineering

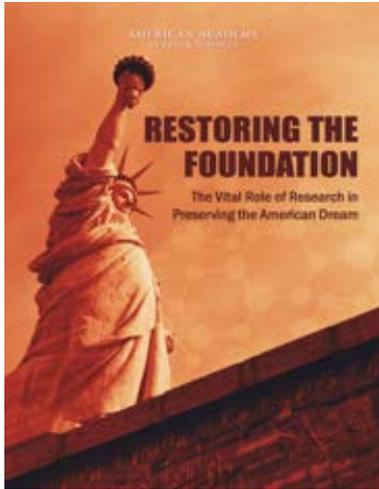
Joanne Tornow, Assistant Director, Biological Sciences

Meghan Houghton, Senior Advisor, CISE

Outline



NSF partners with a range of stakeholders



Prescription 3: Establishing a More Robust National Government-University-Industry Research Partnership



“.. The second pillar I’m proposing involves strengthening the connective tissue among the four components of our research and development ecosystem: federal government, academia not-for-profit foundations, and the private sector.”

-Kelvin Droegemeier, AAAS, 2/15/2019

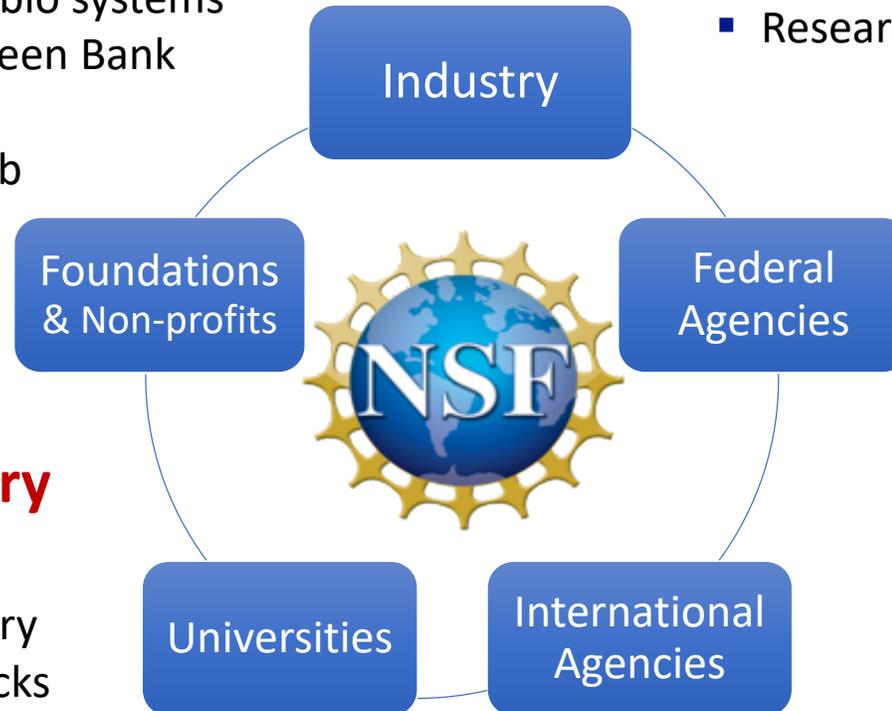
NSF partners with a range of stakeholders

4 foundation partnerships in FY 18

- Simons Foundation: complex bio systems
- Breakthrough Foundation: Green Bank Observatory
- Stand Up To Cancer: IDEAS Lab
- Gates Foundation: BREAD

University-led, with industry partners

- Convergence Accelerator: industry collaboration required for all tracks
- I/UCRC: center co-funding (\$1:\$7 match, NSF:others). >1100 members in 75 I/UCRCs
- Engineering Research Centers
- GOALI: Grant Opportunities for Academic Liaison with Industry



8 industry partnerships in FY 18

- Joint funding opportunities
- Research infrastructure

57 interagency partnerships in FY 18

- Joint funding opportunities
- Research infrastructure
- Workforce training
- Individual projects

with 34 agencies/departments & 7 also included international partners

30 international partnerships in FY 18 (estimated)

- Joint funding opportunities
- Research infrastructure
- Individual projects

Industry partnerships: recent activities

Research Infrastructure

- Cloud credits for BIGDATA, BD Hubs & Spokes: AWS, Google, Microsoft, IBM (up to \$12M)
- Platforms for Advanced Wireless Research (PAWR) (up to \$50M each from NSF, a 28-member industry consortium)

Industry



Education and Workforce

- Boeing: accelerated training, online materials in critical STEM skill areas; increase diversity (\$21M total, starting in FY 19)

Joint Research Solicitations

- Joint NSF/industry research solicitations in targeted areas: Intel, SRC, VMware, Amazon (\$3M – \$10M from each partner)

Universities

International Agencies

Federal Agencies

Foundations & Non-profits

Industry partnerships: value propositions

NSF

- **accelerating discovery and leveraging resources:** financial, expertise, infrastructure
- **accelerating translation** of discovery to deployment
- **growing workforce** capacity, including research
- **increasing NSF's visibility** to different audiences

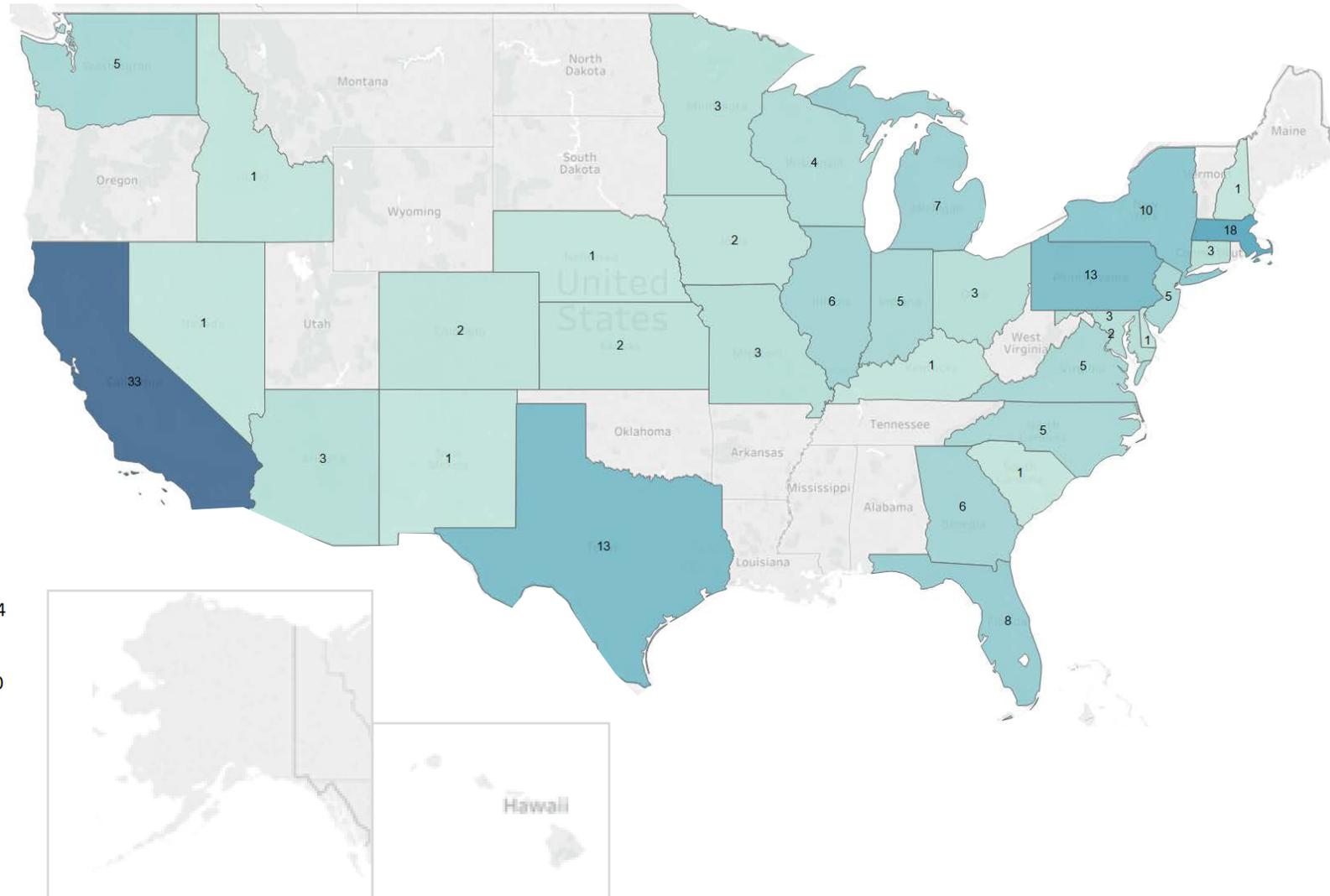


Industry Partners

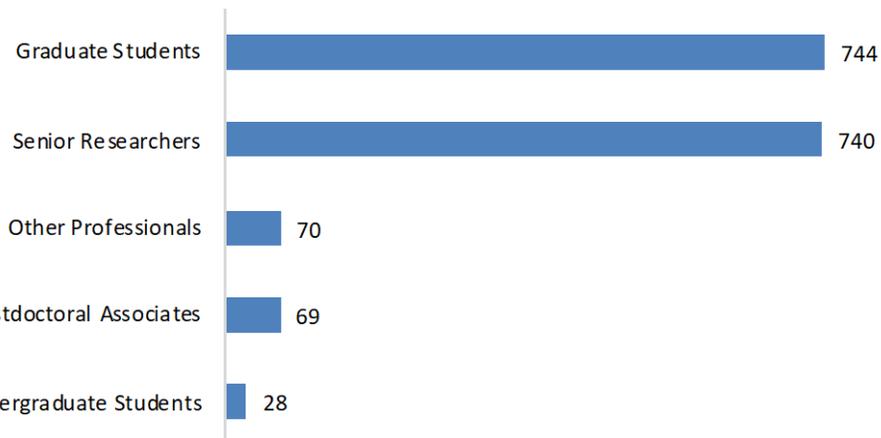
- access to **national research community**
- gold-standard **merit review process**
- **accelerated discovery and leveraged resources:** financial, expertise, infrastructure
- **accelerated translation** of discovery to deployment
- **future workforce** access
- **potential intellectual property** for technical benefit

CISE industry partnerships: summary data

reflecting partnership programs with active awards in FY 2018



Cumulative Person-Years Supported by CISE Partnerships



Industry partnerships: a typical process*

- NSF and industry partner determine:
 - Area(s) of mutual interest
 - Financial or other resource commitments
 - Conflicts of interest, pre-decisional information management
- Establish MOU articulating partnership principles
- Write, issue funding announcement
- NSF-convened merit review process, funding decisions, award issuance
 - Track award outcomes and evaluate partnership

*There is no typical process; all have differed slightly

Industry partnerships: lessons learned

- Each partnership goal is different
- Each partnership mechanism is different
- Each partnership has at least one passionate champion inside the partnering organization and NSF
 - how to communicate value and sustain partnership?
- Strategic challenge: scaling one-off, hand-crafted programs
 - Incentives, culture, value proposition differ between NSF, partners
 - Partner must understand/appreciate NSF policies (e.g., merit review, confidentiality, conflicts of interest)
 - Public, researcher perception of NSF-industry partnerships ranges

Road forward

- We want to broaden partnerships intentionally and strategically, considering lessons learned
- We are discussing how to achieve partnerships at scale, consistent with NSF mission, with resources available now
- We are working to do this internally ...
 - in directorates, convergence accelerator, Renewing NSF, Partnerships APGand externally ...
 - by increasing awareness of NSF's partnerships

THANKS!

Renewing NSF Steering Group

Erwin Gianchandani: CISE
Joanne Tornow: BIO
Tony DiGiovanni: Budget Division
Amanda Greenwell: OLPA
Suzi Iacono: OIA
Formerly Dorothy Aronson, CIO
Formerly Anand Desai, OIA

Renewing NSF Partnerships Co-Leads

Ken Calvert: Division Director, CISE
Andrea Belz: Division Director, ENG
Formerly Barry Johnson, Division
Director, ENG

Renewing NSF Partnerships Team

Anne Doyle: Policy Office
Erin Dawson: Office of General Counsel
Carl Anderson: CISE
Theresa Good: BIO
Meghan Houghton: CISE

Agency Priority Goal Co-Leads

Jim Deshler: Deputy Division Director,
BIO
Ken Calvert: Division Director, CISE

Agency Priority Goal Deputy Co-Leads

Tara Bracken: BIO/OLPA
Meghan Houghton: CISE

Agency Priority Goal Team

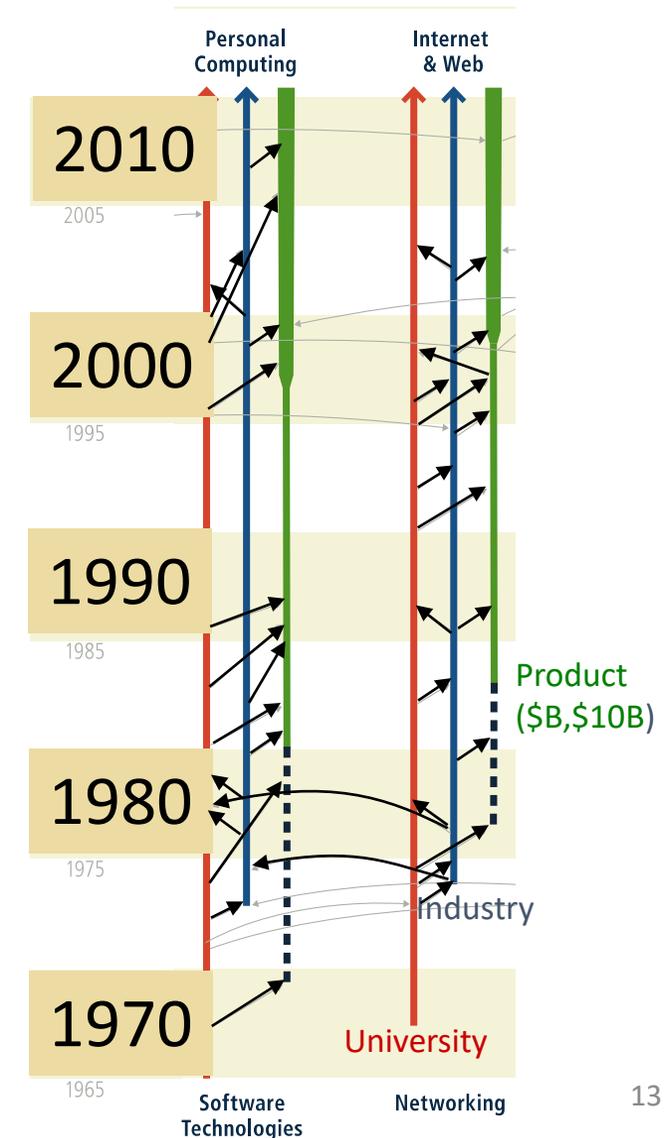
Amber Baum: BFA
Anne Emig: OISE
Clark Cooper: MPS
Terry Davies: GEO
Darren Dutterer: ENG
Jean Feldman: Policy Office
Soo-Siang Lim: SBE
Leah Nichols: OIA
Karen Santoro: Office of General Counsel
Lee Zia: EHR

Backup

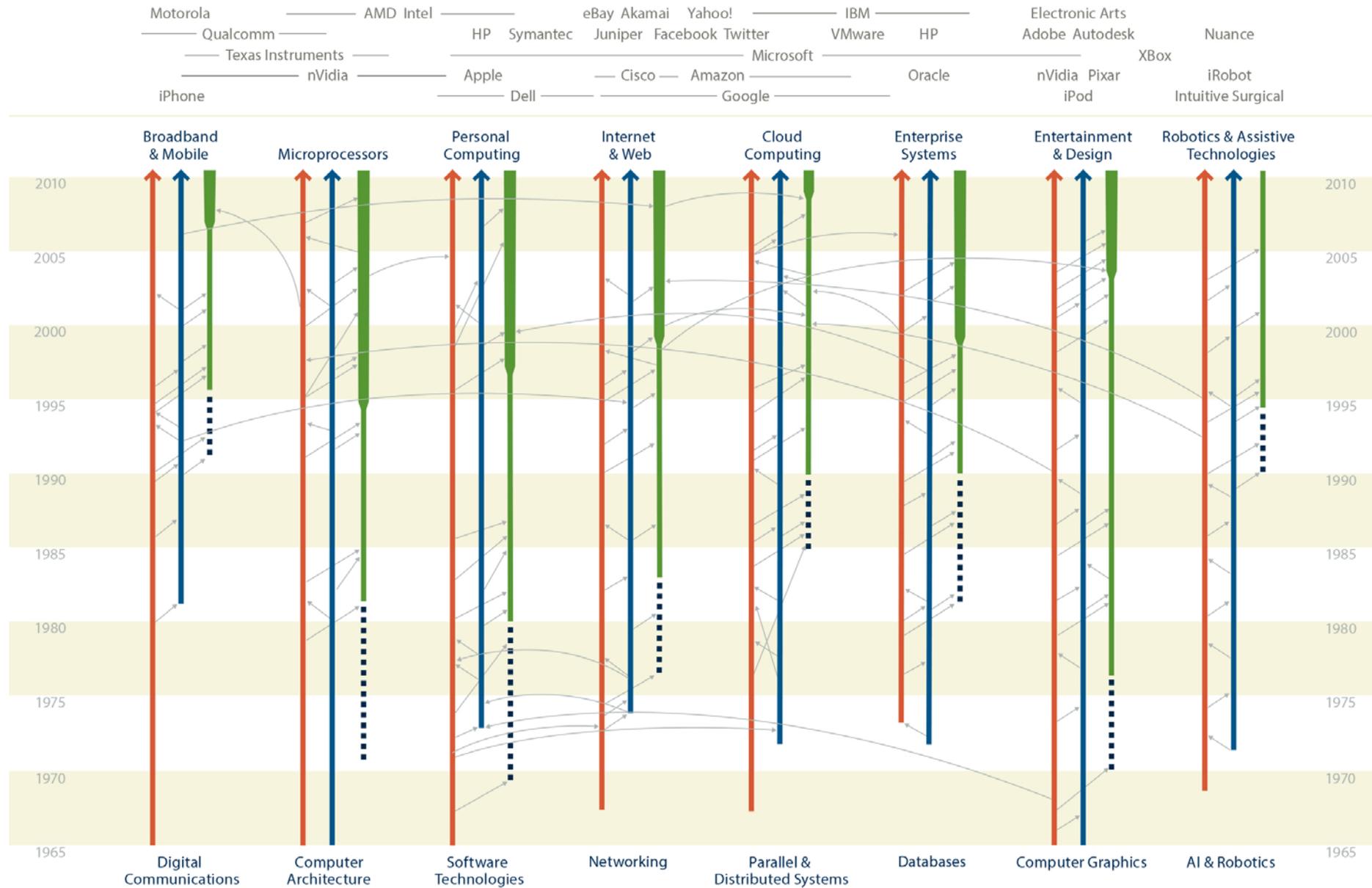
CISE-funded projects have remarkable impact

Advances in computing, communications, information technologies, and cyberinfrastructure:

- **drive U.S. competitiveness**
 - IT accounts for 25% of economic growth since 1995;
 - resulted in many billion-dollar industries: networking, software, digital communications, computer graphics, AI and robotics, and more
- have profound **impacts on our daily lives.**



From Federally-funded research to billion-dollar industries



NSF/Intel Joint Funding: Project Outcomes Example



Award Abstract #1539131

**VEC: Small: Collaborative Research: Wide Field of View Monocentric
Computational Light Field Imaging**

Light field imaging advances made by combining:

- AI-based reconstruction algorithm innovations @ Stanford (PI: Wetzstein); and
 - Developments in optics systems @ UCSD (PI: Ford)
- For interpreting wide field-of-view scenes and 3D imaging.

What are the artifacts of innovation?

- Students trained, papers published, start-up investment

Where are the expected impacts?

- Using this AI-driven approach to imaging, the team demonstrated significant advances to the perception capabilities for robotic vision, defense, remote sensing, medical imaging, and autonomous vehicles.



Letter | Published: 05 March 2018

Confocal non-line-of-sight imaging based on the light-cone transform

Matthew O'Toole , David B. Lindell & Gordon Wetzstein 



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USA (English)

TRUST Synack ELEMENT AI JOBY DataRobot spotinst NORTH
INTEL CAPITAL. WHERE GREAT COMPANIES ARE BUILT.