# TIP

## Directorate for Technology, Innovation and Partnerships

April 2022

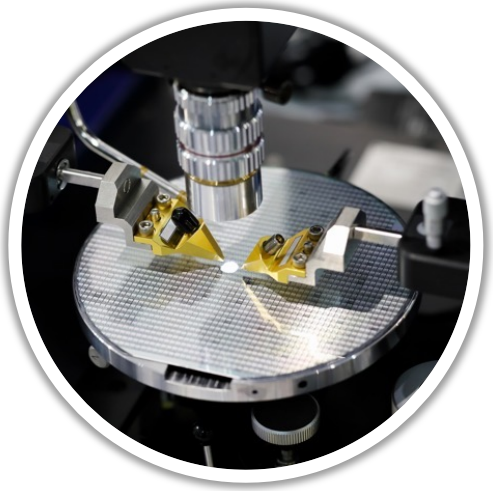
# A Pivotal Moment for the Nation and Society

Climate change

Equitable access to education, health care

Critical and resilient infrastructure

# A Changing Science and Engineering Enterprise Can Meet This Moment



Pace of discovery accelerated by data, emerging technologies

Demand for societal and economic impact

Opportunity to leverage partnerships

# Technology, Innovation and Partnerships (TIP) Directorate

TIP harnesses the nation's vast and diverse talent pool to advance critical and emerging technologies, address pressing societal and economic challenges, and accelerate the translation of research results from lab to market and society. TIP improves U.S. competitiveness, growing the U.S. economy and training a diverse workforce for future, high-wage jobs.

# A New “Horizontal”: Strengthen, Scale Use-Inspired and Translational Research

# TIP Focuses & Cross-Cutting Platform

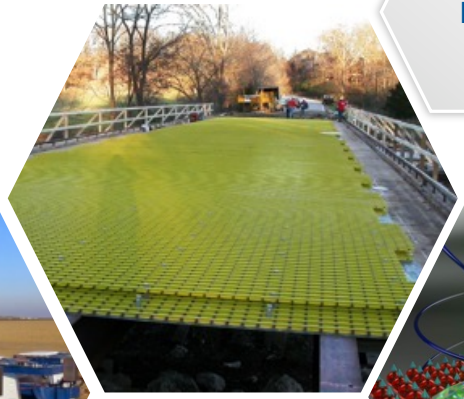
TIP integrates with NSF's existing directorates and fosters partnerships—with government, industry, nonprofits, civil society and communities of practice—to leverage, energize and rapidly bring to society use-inspired research and innovation.

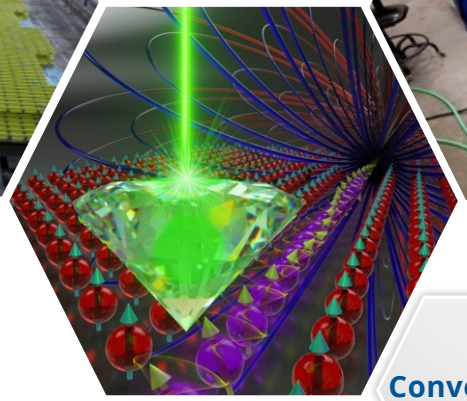
| Fostering Innovation Ecosystems | Establishing Translation Pathways | Partnering to Engage the Nation's Diverse Talent |
|---|---|---|
| Nurtures regional and national innovation and technology ecosystems to support researchers and innovators to converge, develop and accelerate use-inspired research for societal impact. | Supports startups through a lab-to-market platform and establishes new pathways for translating research results for society. | Advances and deepens high-impact, public and private partnerships across all areas of science, engineering and education to cultivate innovation ecosystems, create technology solutions, and support future STEM leaders. |

# TIP Programs

America's Seed Fund (SBIR/STTR)

PFI





I-Corps

POSE

Future Programs

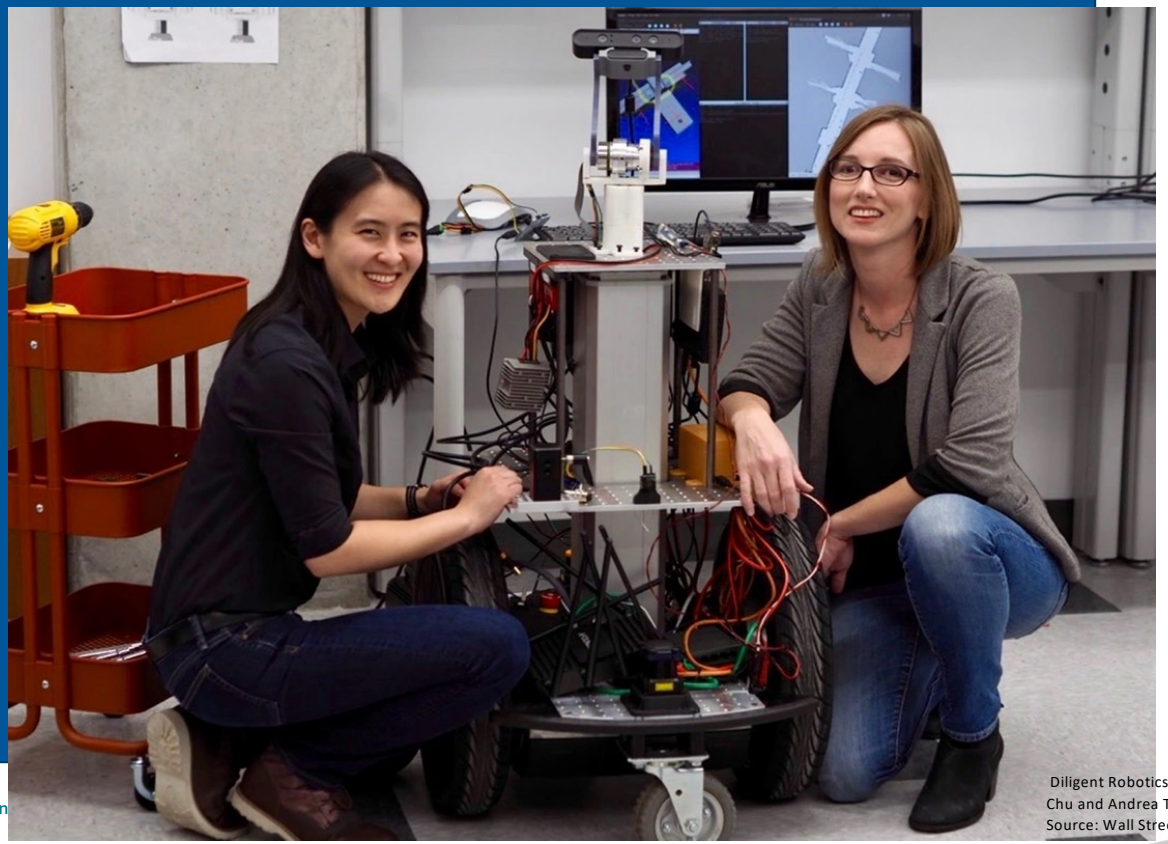
Convergence Accelerator

- Foster regional innovation and technology ecosystems
- Create experiential learning opportunities
- Prepare students for the wide range of potential future jobs

# NSF: Making an Impact – Example of a journey through TIP innovation programs

TIP

# Diligent Robotics



Diligent Robotics Co-Founders Vivian Chu and Andrea Thomaz
Source: Wall Street Journal

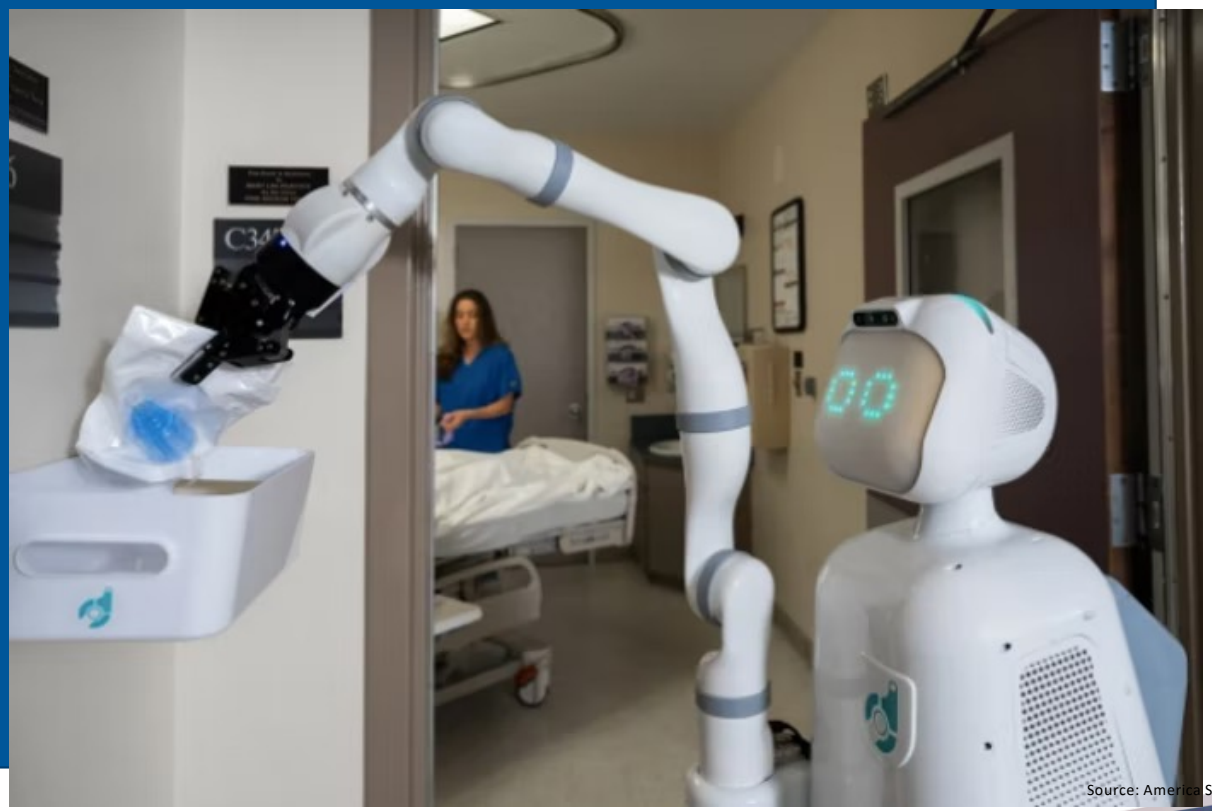
# The Beginning

July 2008 - July 2011
*An HRI Approach to Robot Learning by Demonstration*
**Information and Intelligent Systems (IIS) Core Programs, Robust Intelligence**

March 2010 - March 2015
*Socially Guided Machine Learning*
**Faculty Early Career Development (CAREER)**

Sept 2013-Sept 2016
*Learning from Demonstration for Cloud Robotics*
**National Robotics Initiative**

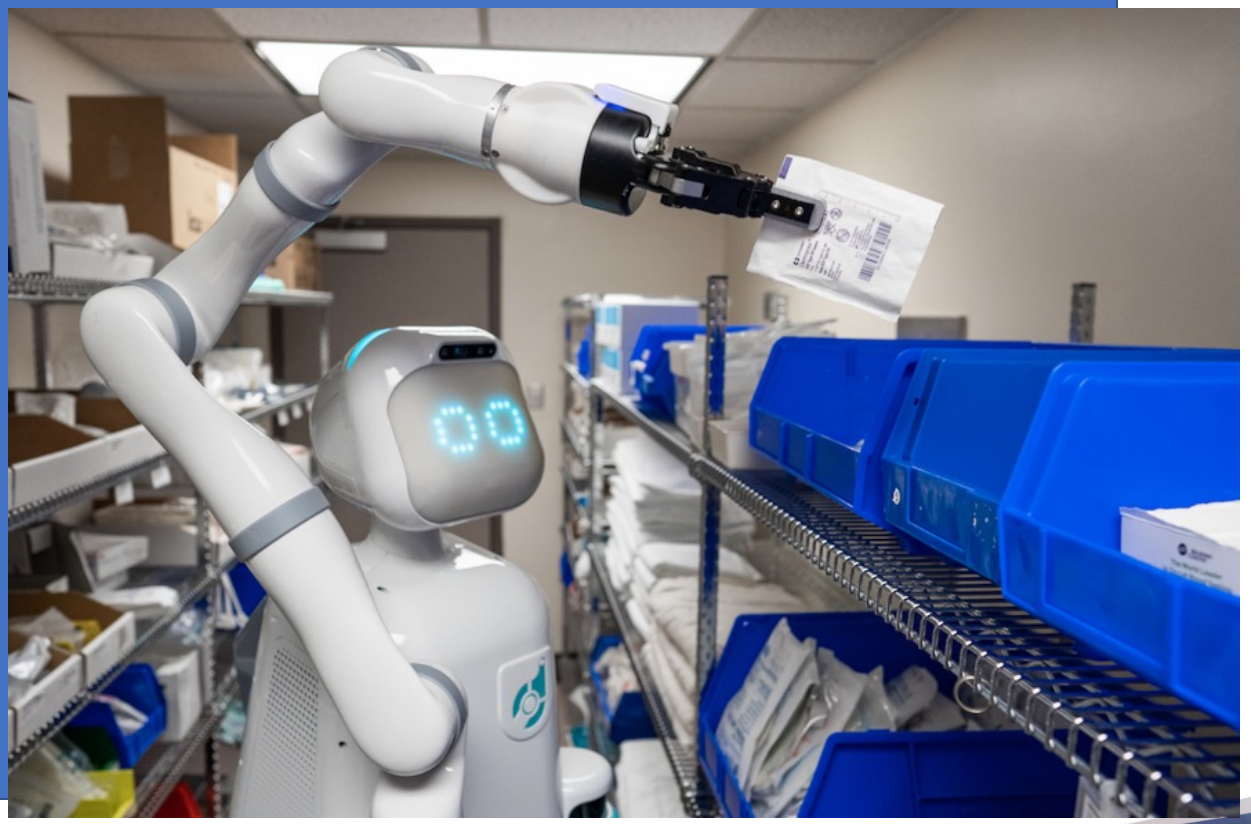
# I-Corps: Healthcare Service Robots



Source: America Seed Fund

# SBIR Phase I: Developing healthcare service robots to improve hospital workflow

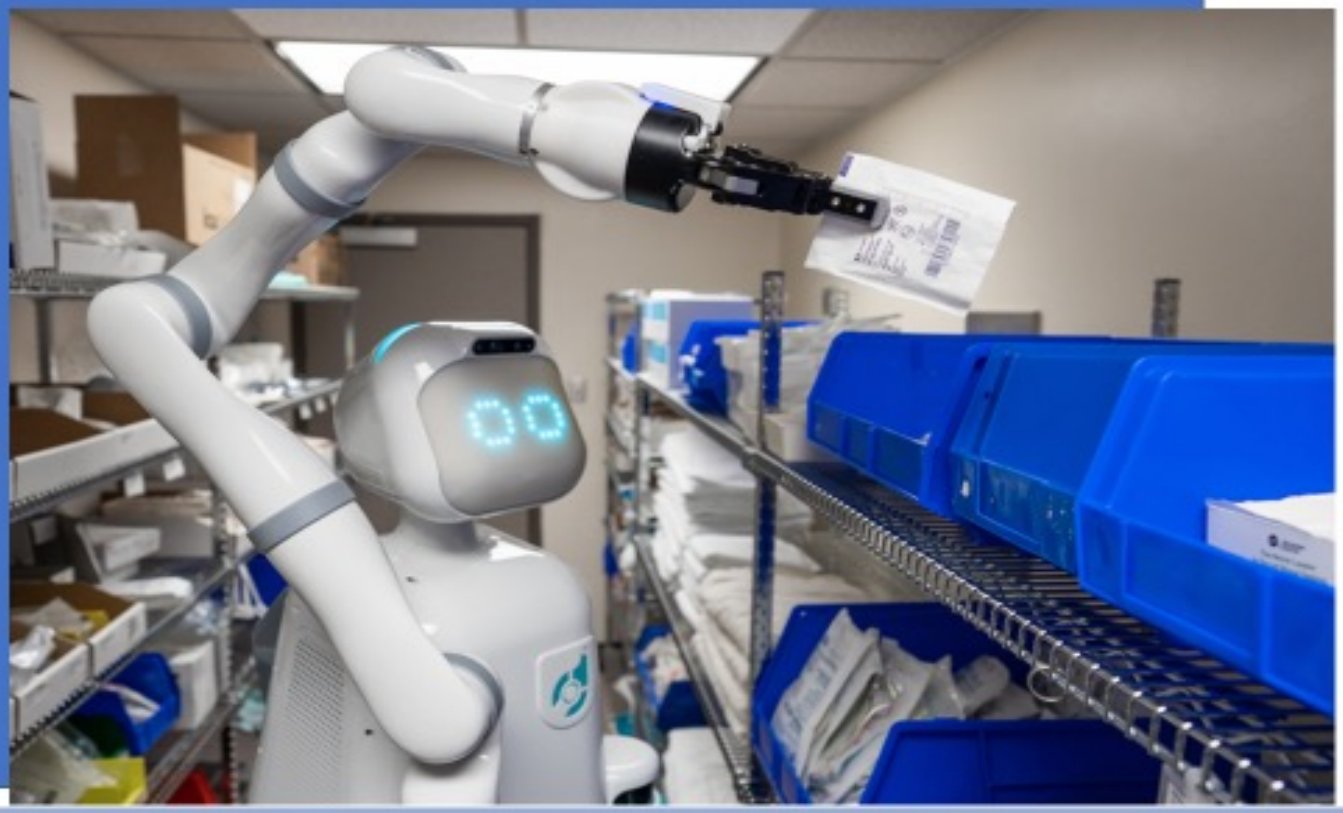
# SBIR Phase II: Mobile Manipulation Hospital Service Robots



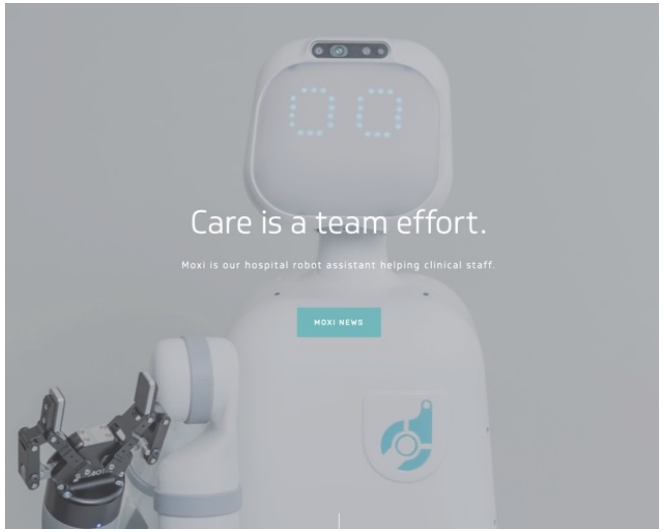
# Today

Source: Dallas Morning News

# SBIR Phase II: Mobile Manipulation Hospital Service Robots



# Diligent Robotics




- 0953181: CAREER: Socially Guided Machine Learning (CISE/IIS)
- 1547769: I-Corps: Healthcare Service Robots
- 1621651: SBIR Phase I: Developing healthcare service robots to improve hospital workflow
- 1738375: SBIR Phase II: Mobile Manipulation Hospital Service Robots
- Watch their video
- https://www.diligentrobots.com/press

# The LASIK story

This SBIR Phase I project investigated the scientific, technical and commercial feasibility of laser surgical systems for the treatment of glaucoma.

1989: PHY STC (Mourou) → 1994: Approx founding of Intralase → 1997-9: SBIR Phase I, II → 2007: Advanced Medical Optic acquires Intralase for $808M (later acquired by Abbott for $2.8 B) → 2018: Mourou, Strickland win Nobel Prize

Center for Ultrafast Optical Science

This SBIR Phase II project developed an optimized ultra-short pulsed laser surgical device for high precision surgery in the sclera of the eye. This tool enabled novel, office-based procedures to treat serious and common conditions, such as glaucoma and presbyopia.

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9761528 Hamilton
9901726 Sahai

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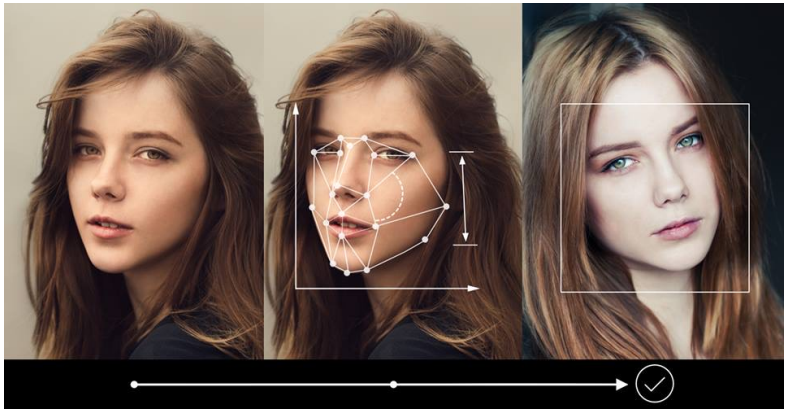

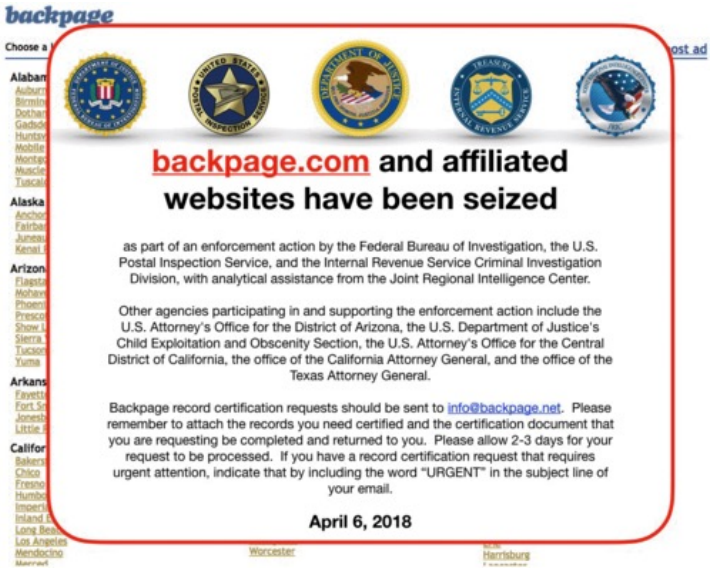


MARINUS ANALYTICS

# TIP Summarized

- Use-inspired, challenge-driven, convergent research
- Innovation and technology translation
- Leveraging the virtuous cycle of foundational and use-inspired research
- Long-term, large scale
- Public-private partnerships
- Education, workforce, diversity

# TIP

Technology, Innovation and Partnerships

## Contact TIP:
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