

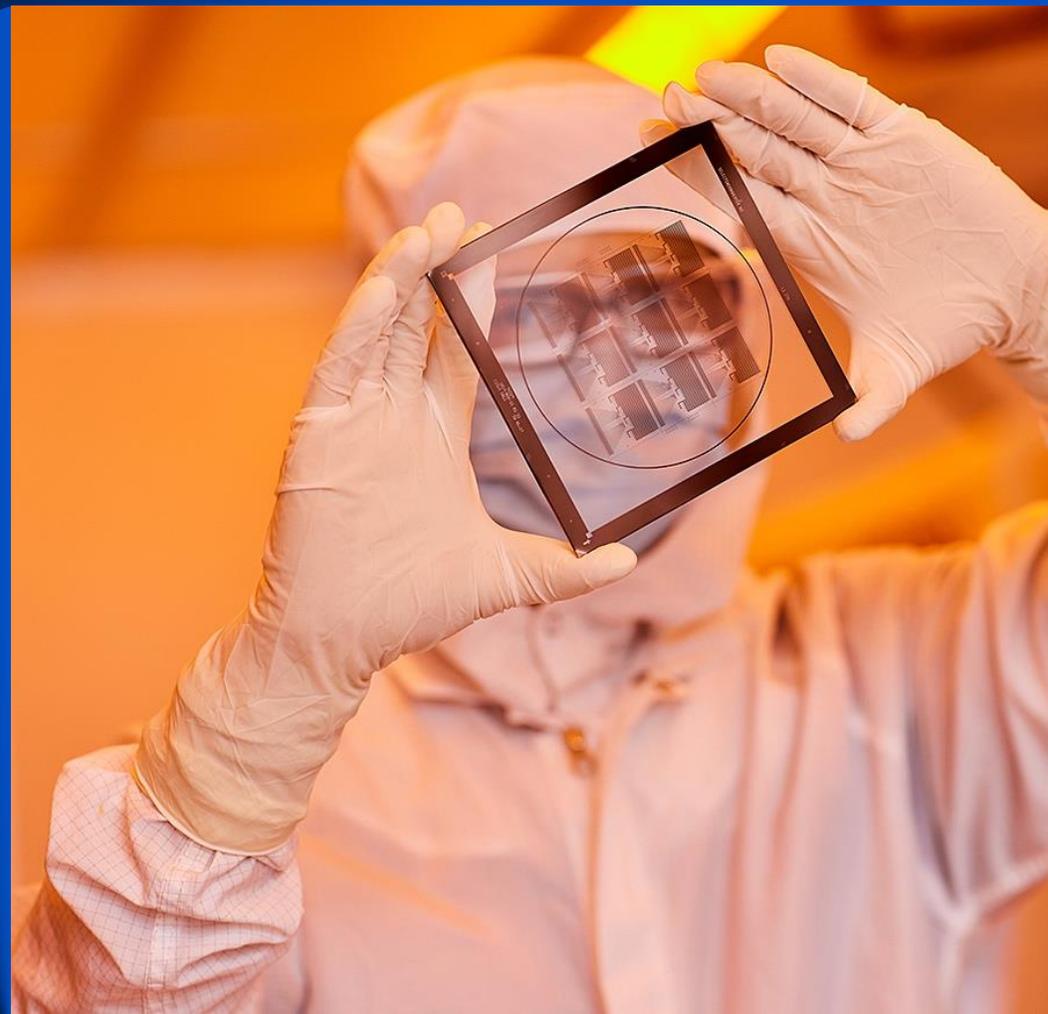


# SRI: History and Future

Aramco cohort 7

October 16th 2024

©2023 SRI INTERNATIONAL. ALL RIGHTS RESERVED. PROPRIETARY.



RISE

CORPORATE  
INNOVATION  
SUMMIT 2023

The slowest pace of change we will ever experience is right now; embrace it, don't fear it. The mathematical function of progress is exponential, and within the last 10 years lies the blueprint for our evolution.

**Chris Cowart**

Managing Director  
Nomura-SRI Innovation Center

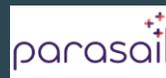


# Chris Cowart

Managing Director, Nomura-SRI Innovation Center

Innovation . Operating . Investment . Future Visions

## SRI International®



Attention Span  
Media

# Independent. Mission-driven. Non-profit.



We create and deliver world-changing solutions for a safer, healthier, and more sustainable future.



Founded in 1946 by Stanford University, became independent in 1970

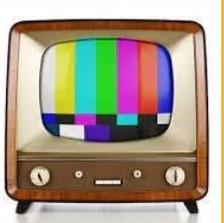


Sarnoff Corporation (formerly RCA Labs), founded in 1942, acquired by SRI in 1987



Palo Alto Research Center (PARC) founded by Xerox in 1970, acquired by SRI in 2023

## A legacy of innovation

	<b>ETHERNET NETWORKING</b>		<b>MOTOBOT</b>		<b>FIRST AUTONOMOUS ROBOT</b>		<b>ALTO PC</b>		<b>SIRI</b>
	<b>CYBERSECURITY</b>		<b>LIQUID CRYSTAL DISPLAY</b>		<b>NASA PARKER SOLAR PROBE</b>		<b>COMPUTER MOUSE</b>		
	<b>AUTOMATED DRUG DISCOVERY</b>		<b>GRAPHICAL USER INTERFACE</b>		<b>COLOR TV SATELLITE TV HDTV</b>		<b>ROBOTIC SURGERY</b>		<b>ELECTRONIC BANKING</b>

# Deep technological capabilities



For nearly 80 years, we have collaborated across technical and scientific disciplines to discover and develop groundbreaking products and technologies and bring innovations and ideas to the marketplace.



## Advanced Technology & Systems

- Sensing
- Robotics & automation
- Space systems
- Quantum

## Information & Computing Sciences

- AI & Machine learning
- Cybersecurity
- Speech analytics
- Computer vision

## Education

- Education policy
- Assessments
- Supporting children at risk
- Technology and learning

## Future Concepts

- Intelligent Systems
- Digital Design & Mfg.
- Energy, Sustainability and Cleantech
- Novel Materials
- Digital Workplace

## Integrated Systems & Solutions

- Microelectronics
- Imaging solutions
- Microcircuit emulation
- Video test and measurement

## Biosciences

- Drug discovery
- Novel therapeutics
- Brain sciences
- Preclinical and clinical development

# Strategic initiatives



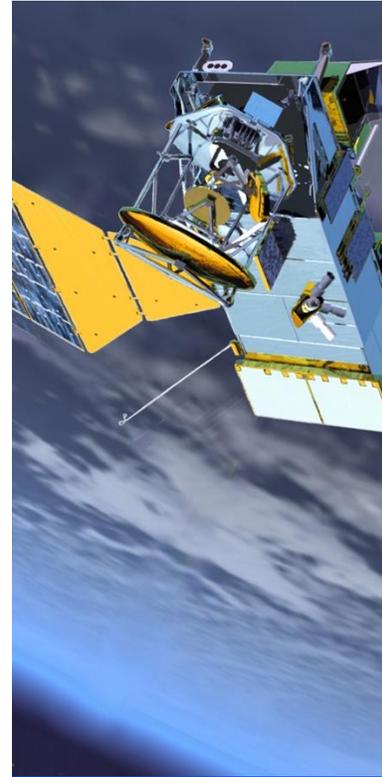
Climate, energy  
& sustainability



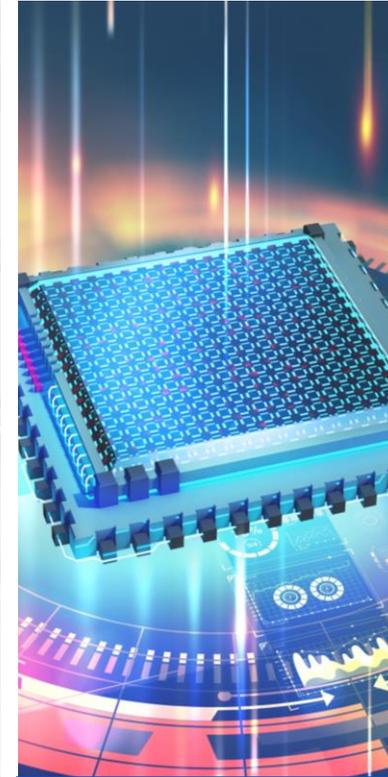
Personalized /  
precision medicine



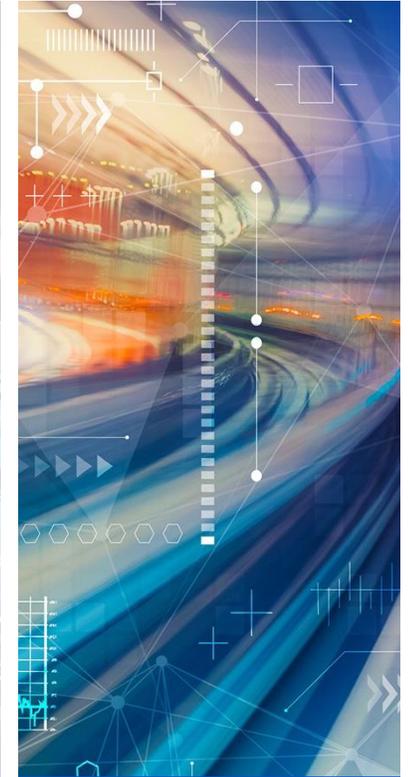
Human machine  
collaboration



Space



Quantum

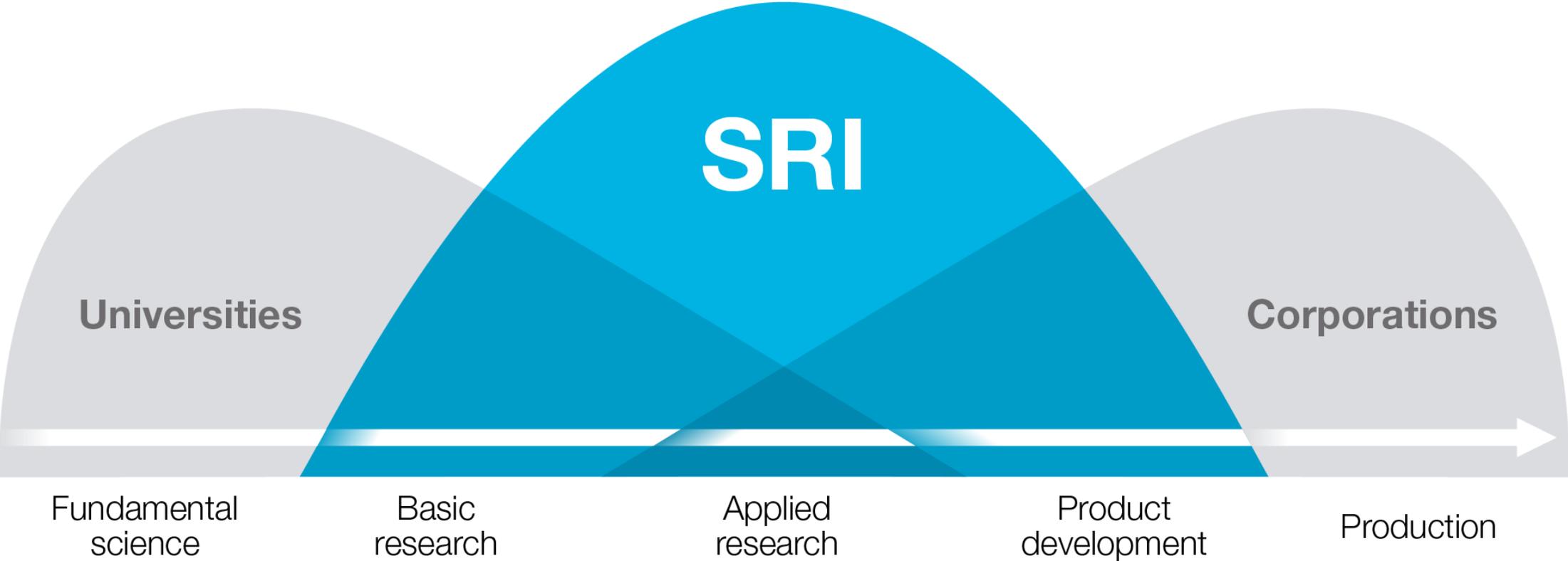


Future of work  
and education

# From Basic Research to Commercialization



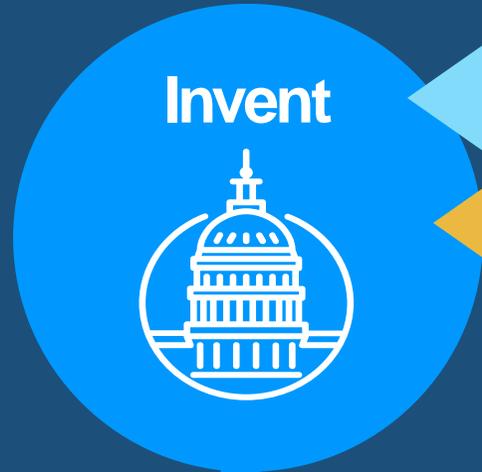
Synchronize Tech Innovation with Business Model innovation to deliver successful value to market



# From Basic Research to Commercialization



Easy to describe, very challenging to do!



25+ Licenses &  
5+ Startups/ year



INTUITIVE



se/sm/c



100+ Industry  
Projects / year

# Ways we innovate together

## SRI's Business Model:

- Contract Research and Development
- Innovation Services
- Specialty & Scientific Products
- Tech Transfer & Licensing
- Ventures

## How to work with SRI:

- Federal Government: We work on science and systems for federal agencies via grants, contracts, IDIQs, OTAs and other contracting vehicles
- Industry: Industry sponsored and collaborative research projects from POC to prototype and technology transition through licensing. Corporate innovation programs
- Foundations: Research, evaluations and program assessments that promote foundation priorities
- Entrepreneurs & VCs: SRI incubates, accelerates and spins-out technology-based startups
- International, State & Local governments: Research projects, economic & technology policy + readiness assessments and strategic consulting services



# Case Study: AMISR to LeoLabs

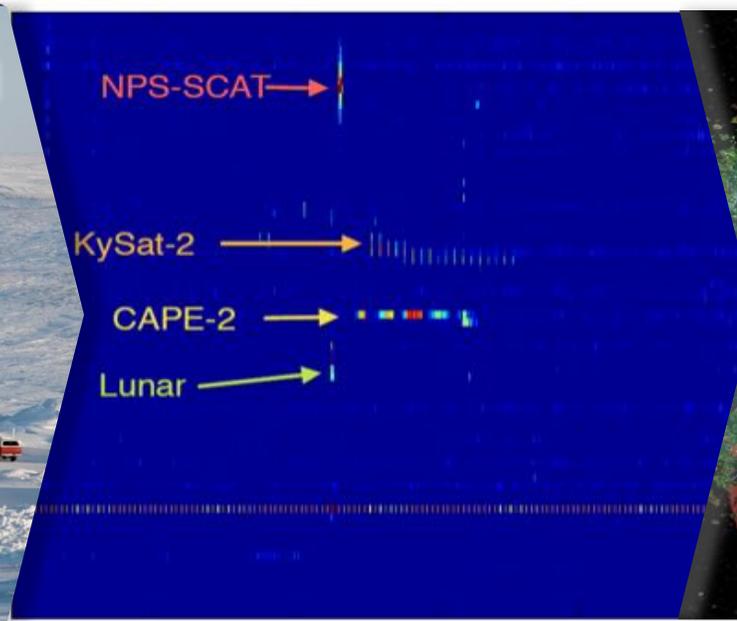
Good science leads to exciting business capability



Early 2000's  
NSF sought an advanced radar instrument for fundamental ionospheric research



In 2006 SRI designed, built and continues to operate AMISR, a low-cost phased array radar for NSF (Poker Flats, Alaska)



In 2013 SRI began detecting and tracking Cubesats in low-earth orbit (LEO)



In 2016 SRI spins-out LeoLabs as first commercial, radar-based space situational awareness company

# Case Study:

## Augmentation in High-value Human Tasks: Productivity

### CHALLENGE & GOAL

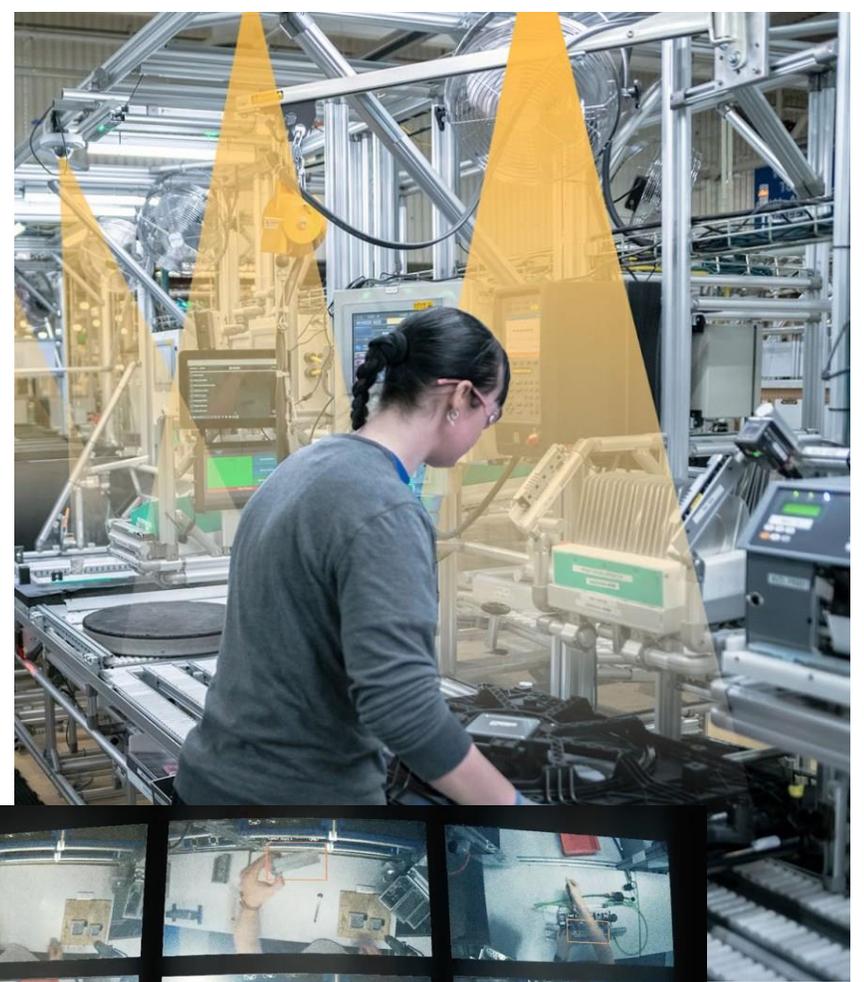
Denso's goal was to drive productivity, quality and traceability on the manufacturing line. Denso was seeking a way to analyze human productivity with minimal capital cost, no manufacturing process modifications and no change in operator activity.

### SOLUTION

SRI applied multimodal "behavior analysis", originally developed under a DARPA project, to detect, monitor and evaluate human operators in a complex assembly process. Following a 3-month proof-of-concept project, SRI incubated Drishti, a startup (with seed investment from Denso), that is developing machine learning systems to identify high-value manufacturing tasks that are optimized for human labor.

*A \$25M venture investment helps Drishti push their technology further into Automotive and Electronics manufacturing.*

*Drishti was recently acquired by a large technology company.*



Ok, I found these **italian restaurants** which reviews say **are romantic** close to your work:

Restaurants  
by location, rating

Map All

**La Pastaia Ristorante & Enoteca**  
San Jose, 0.1 miles  
Yelp - 63 reviews  
Call

**The Old Spaghetti Factory**  
San Jose, 0.2 miles  
Yelp - 305 reviews  
Call

**Spiedo Ristorante**  
San Jose, 0.2 miles  
Yelp - 1 review  
Call

Tap it... Say it!

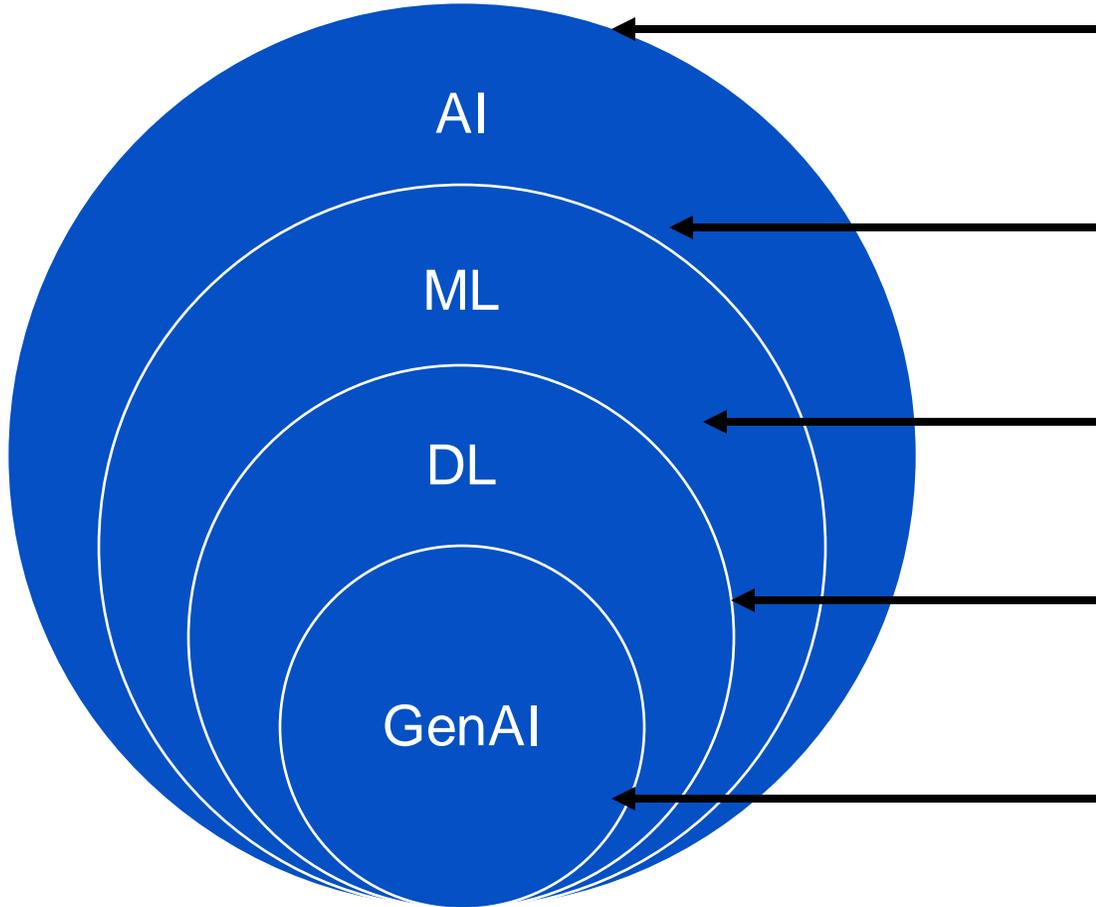


# SRI Robotics breakthroughs



# SRI and AI

*A history going back to the 1960s*



## **Shakey / A\*:**

First mobile autonomous robot / 1968



**NUANCE**

## **Nuance:**

Automated natural language processing / 1996



## **Calo / Siri:**

Interactive virtual assistant / 2003-2007



## **DASL**

Learning with less data / 2018



## **ATHENA:**

Contextual knowledge management / 2022

# SRI's current AI focus areas



## Human-Machine Collaboration

Machines as true partners, optimizing the joint capabilities of humans and machines



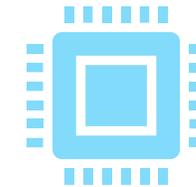
## Reliable Machine Learning

Models that can be understood, debugged, and integrated with expertise to minimize mistakes and enhance performance



## Trustworthy Cyber-Physical Systems

Analysis and behavior prediction to achieve trustworthy systems that include sensors, actuators and other hardware components



## Low Resource AI

AI architectures for distributed low power, low weight devices and ways to achieve high performance using less data.

# Case Study:

## Improving worker performance by proactively delivering needed insights

### CHALLENGE & GOAL

Modern workplaces depend on organizational knowledge such as experiential best practices and company specific workflows that are often poorly understood. This challenge is particularly felt by new employees who may not even know what questions to ask. Organizations need a system that proactively finds, stores, and delivers insights, best practices, and context-specific knowledge when and where it is needed.

### SOLUTION

**SRI ATHENA** was created to become virtual member of your Community of Practice. It uses fine grained indexing and in-the-flow capture to learn your industry, company workflows, and user best practices from both public and private data sources. It then proactively delivers multi-modal information targeted to the individual and context.



*The first evaluation of SRI ATHENA tested worker performance conducting the high technical, high value task of offshore oil well planning. During the fall 2024 evaluation ATHENA users performed **154% better** than workers using state of the art LLM+RAG techniques. Novice users also performed tasks with the same skill level as experts.*

# Sample interaction using SRI ATHENA demo system

## Agentic AI built for DARPA KMASS



New Chat Portal version 1.15.14

Which one of the following adverse drilling events occurred in well 15/9-F-15 on September 24, 2008? At what depth was the situation resolved?

To determine the adverse drilling event and the depth at which it was resolved, we need to examine the activities and issues reported for September 24, 2008.

- Adverse Event:** The adverse drilling event that occurred was a "pack off" in the rathole at 1374 meters MD (Measured Depth). This is indicated by the statement: "Packed off in rathole at 1374 m MD."
- Resolution Depth:** The situation was resolved at 1368 meters MD. This is indicated by the statement: "Worked string upwards and pulled into casing shoe at 1368 m MD while circulating at 3000 lpm."

Thus, the adverse drilling event was a pack off at 1374 meters MD, and the situation was resolved at 1368 meters MD.

**Answer:** The adverse drilling event was a pack off at 1374 meters MD, and it was resolved at 1368 meters MD. ([Daily Drilling Report for Wellbore 15/9-F-15 on 2008-09-24](#))

Here are insights generated by past users and ATHENA, selected to potentially help with your task:

- It may be necessary to request each type of adverse drilling event rather than...
- The chatbot may not reply with all of the requested drilling reports. A chatbot...
- The phrase "pack off" is an indicator of a Pipe Sticking event, which is an...

Type a question... 🔍

ATHENA explanation of response

Correct answer

User question

Source document

Proactively delivered insights tailored to user



Demonstration ATHENA system for the oil and gas industry

# Sample interaction using SRI ATHENA demo system

## Agentic AI built for DARPA KMASS



New Chat

Portal version 1.18.0

What was the measured depth for the 15/9-F-12 well on June 26, 2007 at approximately 03:59?

To determine the measured depth for the 15/9-F-12 well on June 26, 2007, at approximately 03:59, we need to look at the operations timeline provided in the documents.

- The operations timeline shows drilling activities with start and end times, along with the corresponding measured depths (mMD).
- From 02:15 to 03:00, the well was drilled from 467 mMD to 473 mMD.
- From 03:00 to 04:00, the well was drilled from 473 mMD to 476 mMD.

Given that the time 03:59 falls within the interval from 03:00 to 04:00, the measured depth at approximately 03:59 would be within the range of 473 mMD to 476 mMD.

**Therefore, the measured depth for the 15/9-F-12 well on June 26, 2007, at approximately 03:59 was approximately 476 mMD.**

( [Daily Drilling Report for Wellbore 15/9-F-12 on 2007-06-26](#) )

[19 more documents examined...](#)

[Add Insights](#) ▾

[See all insights](#)

Type a question...



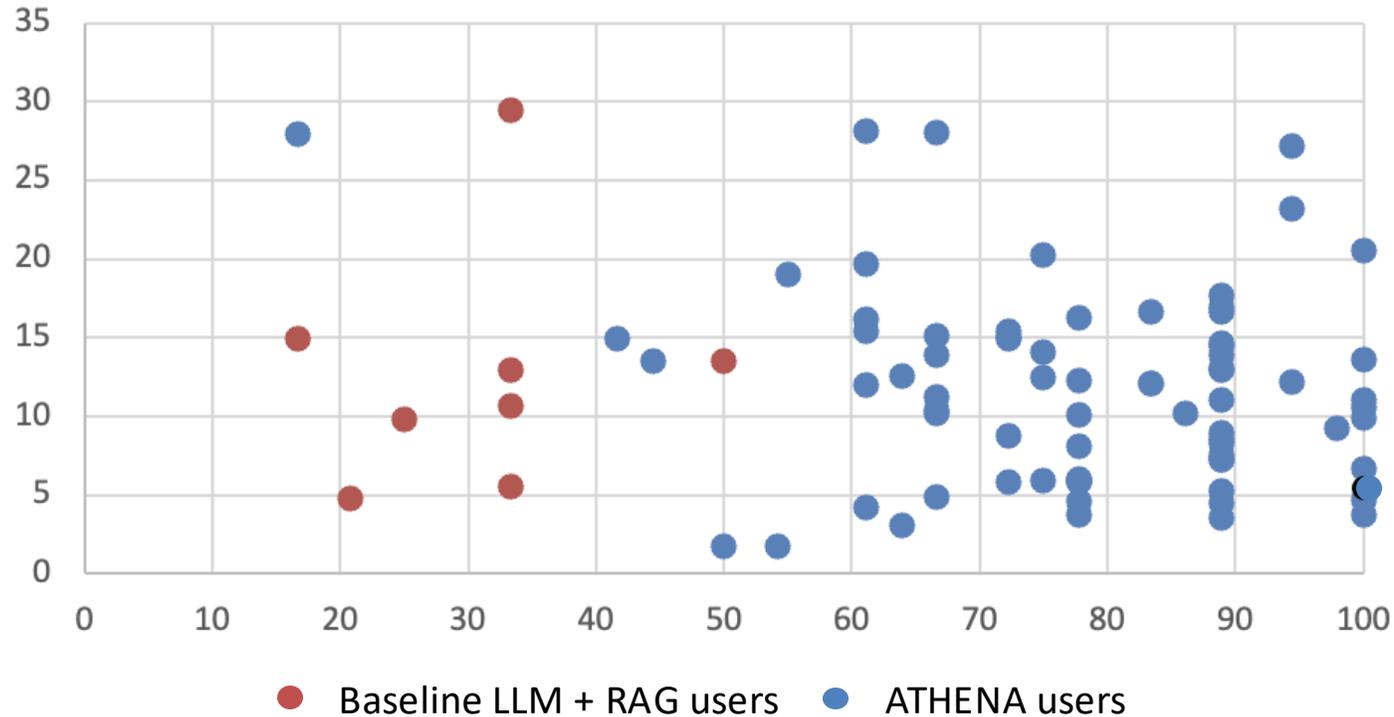
Demonstration ATHENA system for the oil and gas industry

# DARPA evaluation results

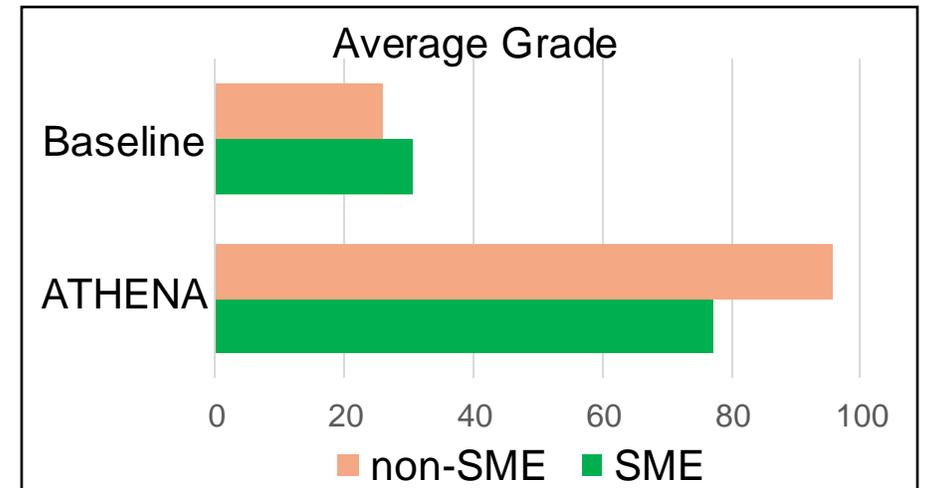
*Novices using SRI ATHENA outperformed experts*



Grade vs Time (minutes)

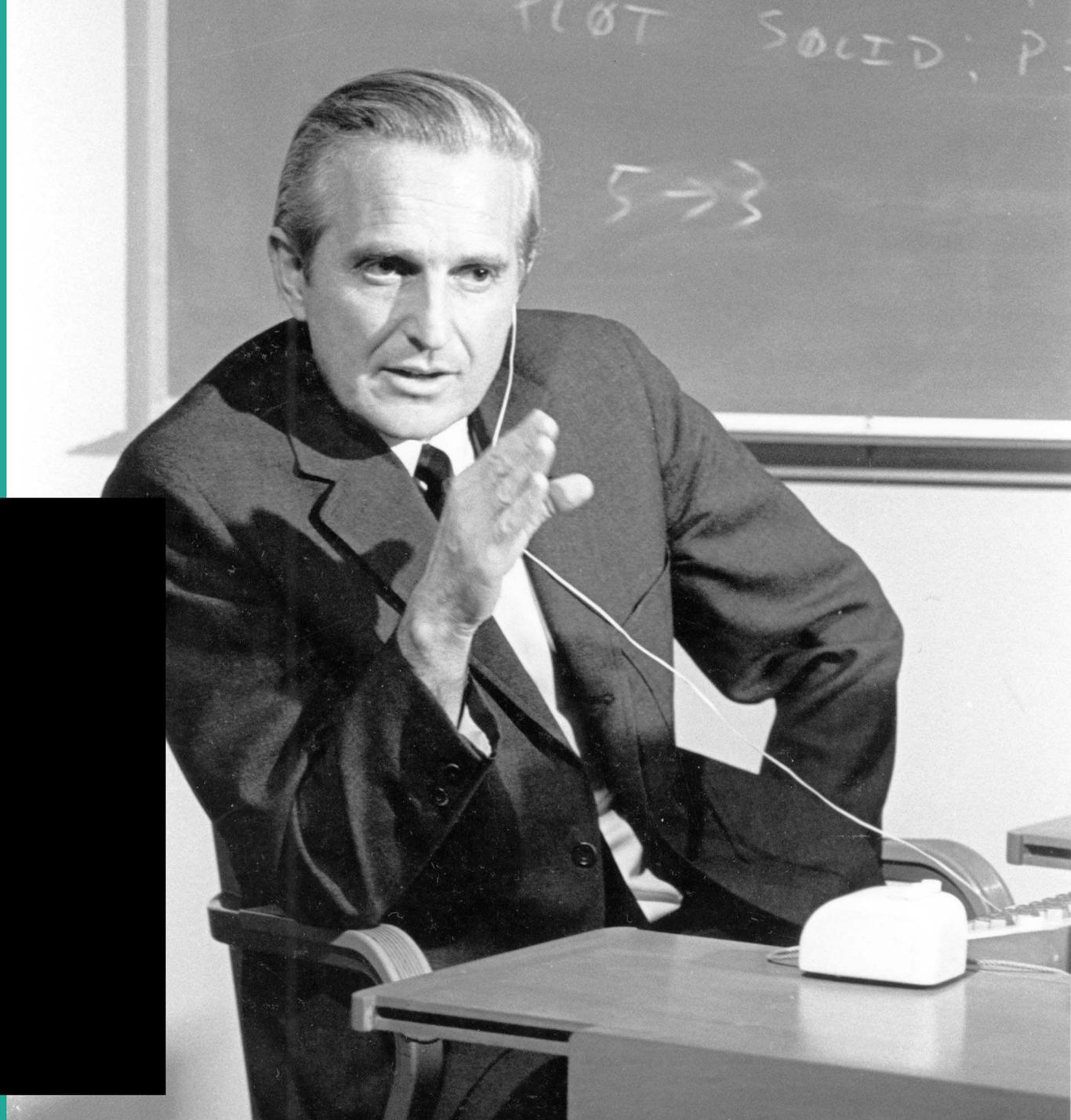


	Avg Grade (0-100)	Failure Rate (<50%)
Baseline LLM+RAG	30.73	0.88
ATHENA	78.13	0.04
<b>Improvement</b>	<b>154%</b>	<b>-95%*</b>



# The Mother of All Demos

The birth of personal

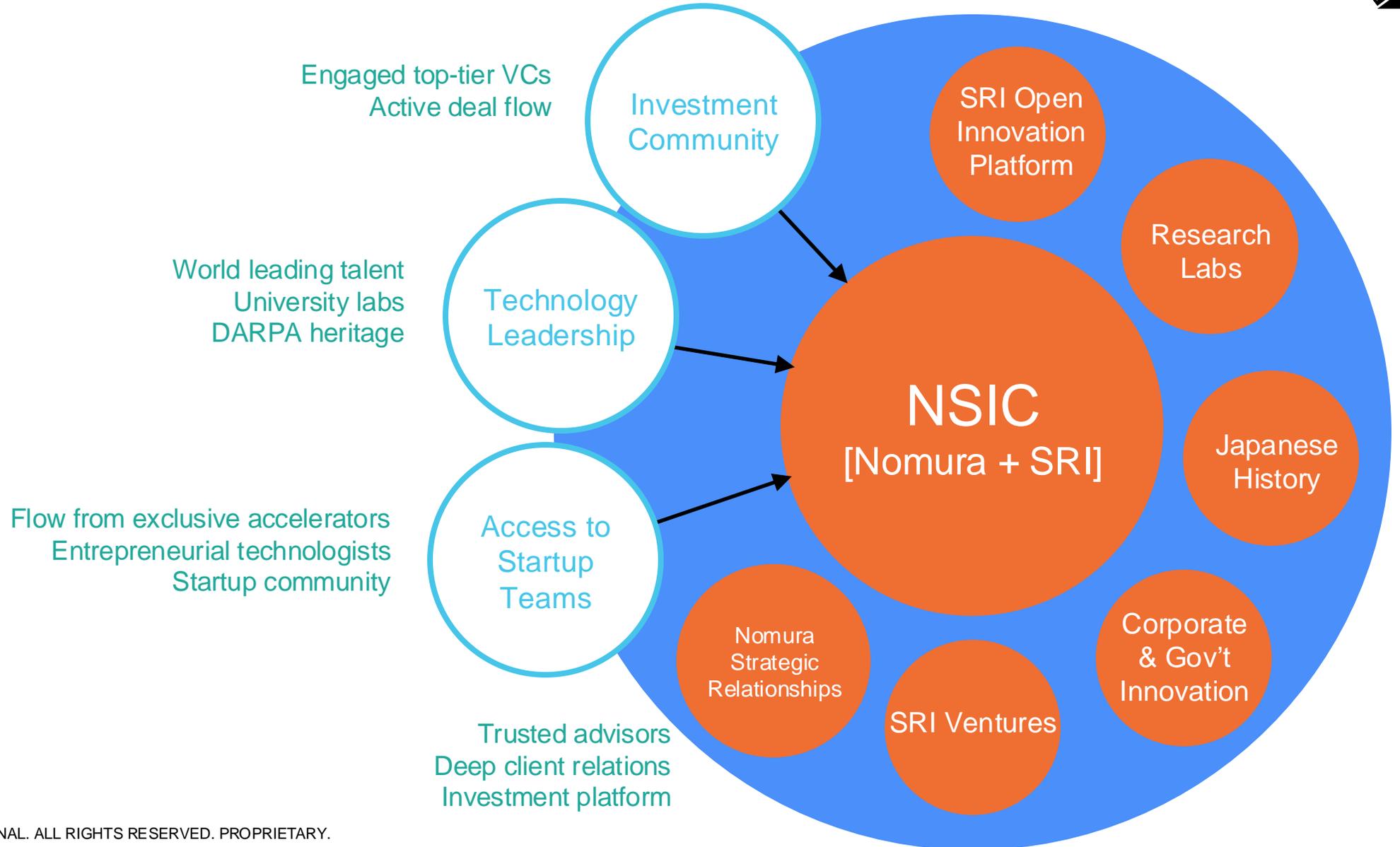




# Key behaviors to lead innovative organizations

[mindset, intrapreneurs, ecosystems]

# Silicon Valley open innovation ecosystem





“Intrapreneurs” are employees who are tasked with creating new and innovative products within an established business.

or, in simpler terms, an in-house entrepreneur.  
and, ideally, they volunteer for this role.

# NOMURA – SRI Innovation Center



Our hypothesis: Japanese corporate innovation could be driven by intrapreneurial projects





**Successful “intrapreneurs”  
continuously read their  
environment to identify and  
launch innovation projects.**

**ADAPTABILITY**



**Intrapreneurs have a job to cycle through disruptive hypotheses as rapidly and roughly as possible.**

**RAPID EVALUATION**



# Key Intrapreneur behaviors & jobs/roles

1. Futurist
2. Designer
3. Risk-Taker
4. Navigator
5. Change-maker



# What we are learning at NSIC in Silicon Valley

## Intentional talent programs to inspire, attract potential intrapreneurs

- + Inspire R&D research teams with what is possible through tech ideation sessions
- + Build an ‘innovation engine’ process to inspire organization participation
- + Mindset shift through intensive short programs in Silicon Valley (can it happen without the trip?)

## Experimenting away from HQ can lead to some surprising ideas

- + Petroleum based chemical R&D team exploring new features of bio plastics
- + Therapeutics company exploring a direct-to-consumer microbiome testing service and wellness business
- + Testing equipment team explores how to prevent the spread of antibiotic resistant bugs

## Experience the real-world journey to launch new ideas from your company

- + Real projects with a future are being launched to shape the future of communication, carbon reduction, and semiconductor performance... real stuff!



**Thank you!**

# SRI Ventures



Where deep technology meets a large market. Our ventures group invests in big ideas that create world-changing enterprises. We contribute advanced intellectual property (IP) and cash, and transfer technology to entrepreneurs.

## ACTIVE

50+ Ventures

> \$100B Market Cap

33% Of our companies have had successful exits

Grid of active venture logos including: Kasisto, zephr, Midday, ACCUKNOX, GoCharlie, ENCOUNTER AI, US POSITRONIX, Confidential, mirro.ai, Authenticiti, GUIDE ROBOTICS, decoded health, Valence VIBRATIONS, NUVIEW, re scan, kurve, MDC, pienso, VITRINA, LatentAI, PASSIO, se/sm/c, XONA space systems, curie, WINGSURE™, Averatek, LEOLABS.

## EXITS

Grid of exit venture logos including: Siri (Acquired by Apple), INTUITIVE SURGICAL® (IPO (NASDAQ)), LIGHTSCAPE materials, inc. (Acquired by Dow), Meta<sup>α</sup> (Acquired by Chan Zuckerberg), NUANCE (IPO (NASDAQ) Acquired by Microsoft), ORCHID CELLMARK (DNA testing trusted worldwide. IPO (NASDAQ)), pulse (Acquired by Mozilla), OTO (Acquired by Unity), Summly (Acquired by Yahoo), tempo (Acquired by Salesforce), Scotty (Acquired by DoorDash), redwood robotic (Acquired by Google), ARTIFICIAL MUSCLE INCORPORATED (Acquired by Parker Hannifin), DESTI (Acquired by Nokia Here), drishti (Acquired by Apple).

# Case Study:

## Augmentation in High-value Human Tasks: Productivity

### CHALLENGE & GOAL

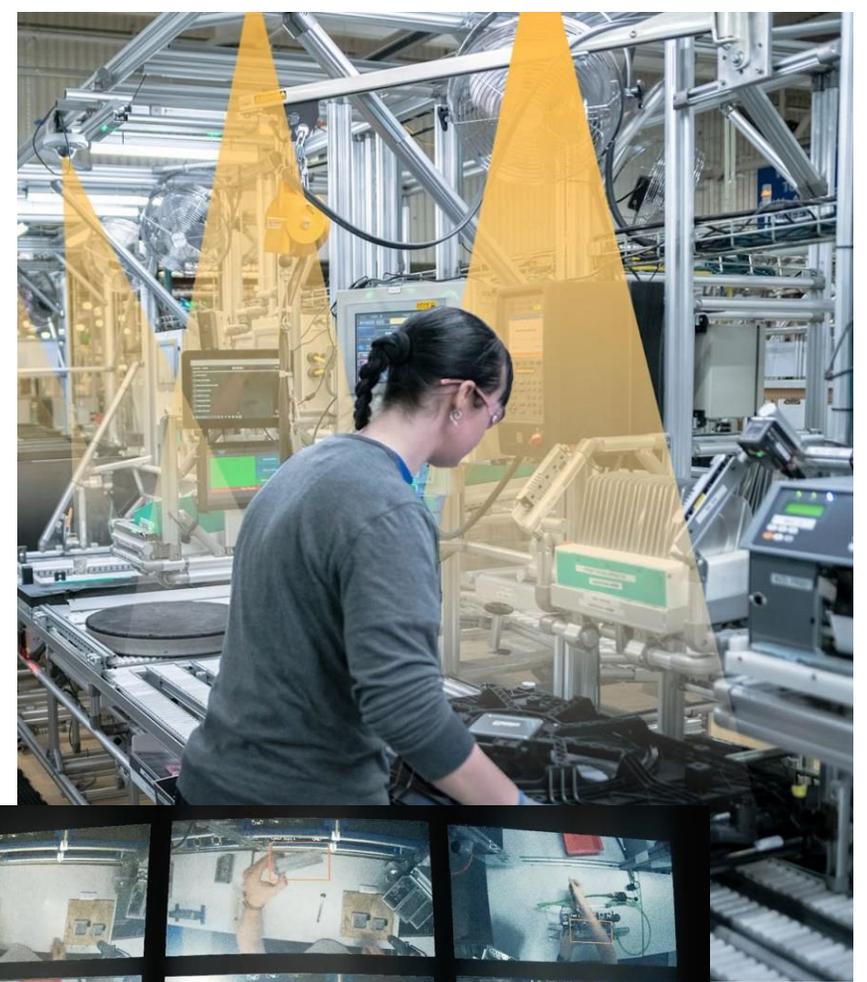
Denso's goal was to drive productivity, quality and traceability on the manufacturing line. Denso was seeking a way to analyze human productivity with minimal capital cost, no manufacturing process modifications and no change in operator activity.

### SOLUTION

SRI applied multimodal "behavior analysis", originally developed under a DARPA project, to detect, monitor and evaluate human operators in a complex assembly process. Following a 3-month proof-of-concept project, SRI incubated Drishti, a startup (with seed investment from Denso), that is developing machine learning systems to identify high-value manufacturing tasks that are optimized for human labor.

*A \$25M venture investment helps Drishti push their technology further into Automotive and Electronics manufacturing.*

*Drishti was recently acquired by a large technology company.*



# Case Study:

## Improving Healthcare delivery in the operating room

### CHALLENGE & GOAL

In order to accelerate participation in a growing market, Ethicon leveraged SRI's 20+ years of **surgical robotics** experience to develop new robotics tools and capabilities for surgeons and operating room professionals that integrate Ethicon's medical devices with leading-edge robotics systems and data systems.

### SOLUTION

*Building on research from DARPA's TraumaPod program, SRI was able to go from concept to initial product development in less than 2 years. Later, SRI assisted in the creation of **Verb Surgical** a new venture created to bring the system to market.*



*Verb Surgical is the result of joint development between SRI, J&J, and Google. In 2020 J&J acquired Verb and into the Ethicon business unit.*

# Case Study:

## Improving worker performance by proactively delivering needed insights

### CHALLENGE & GOAL

Modern workplaces depend on organizational knowledge such as experiential best practices and company specific workflows that are often poorly understood. This challenge is particularly felt by new employees who may not even know what questions to ask. Organizations need a system that proactively finds, stores, and delivers insights, best practices, and context-specific knowledge when and where it is needed.

### SOLUTION

**SRI ATHENA** was created to become virtual member of your Community of Practice. It uses fine grained indexing and in-the-flow capture to learn your industry, company workflows, and user best practices from both public and private data sources. It then proactively delivers multi-modal information targeted to the individual and context.



*The first evaluation of SRI ATHENA tested worker performance conducting the high technical, high value task of offshore oil well planning. During the fall 2024 evaluation ATHENA users performed **154% better** than workers using state of the art LLM+RAG techniques. Novice users also performed tasks with the same skill level as experts.*