

State of the School of Computing

Mary Hall, Director

Industrial Advisory Board Meeting

November 8, 2021

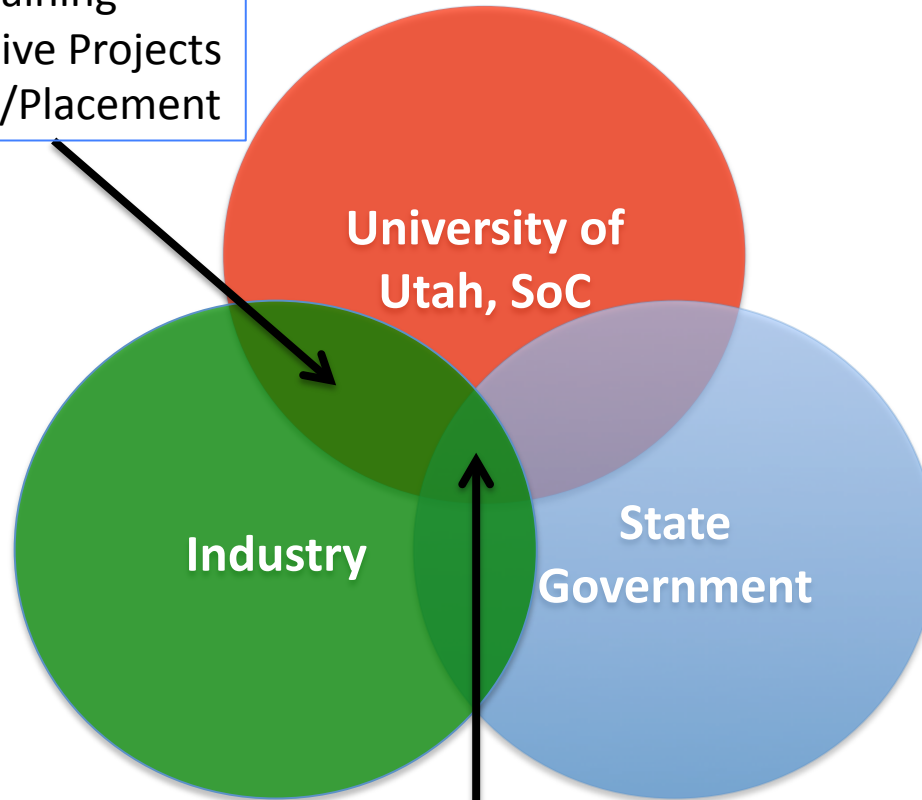


Outline

1. Program context
2. Continued growth
3. Utah Center for Inclusive Computing
4. Clinical Capstone Pilot
5. Workforce-Related Masters Programs
6. Agenda Overview

SoC and Tech Economy

Student Training
Collaborative Projects
Recruiting/Placement



Funding to Support
University/Industry
Collaboration



1. Context of Program

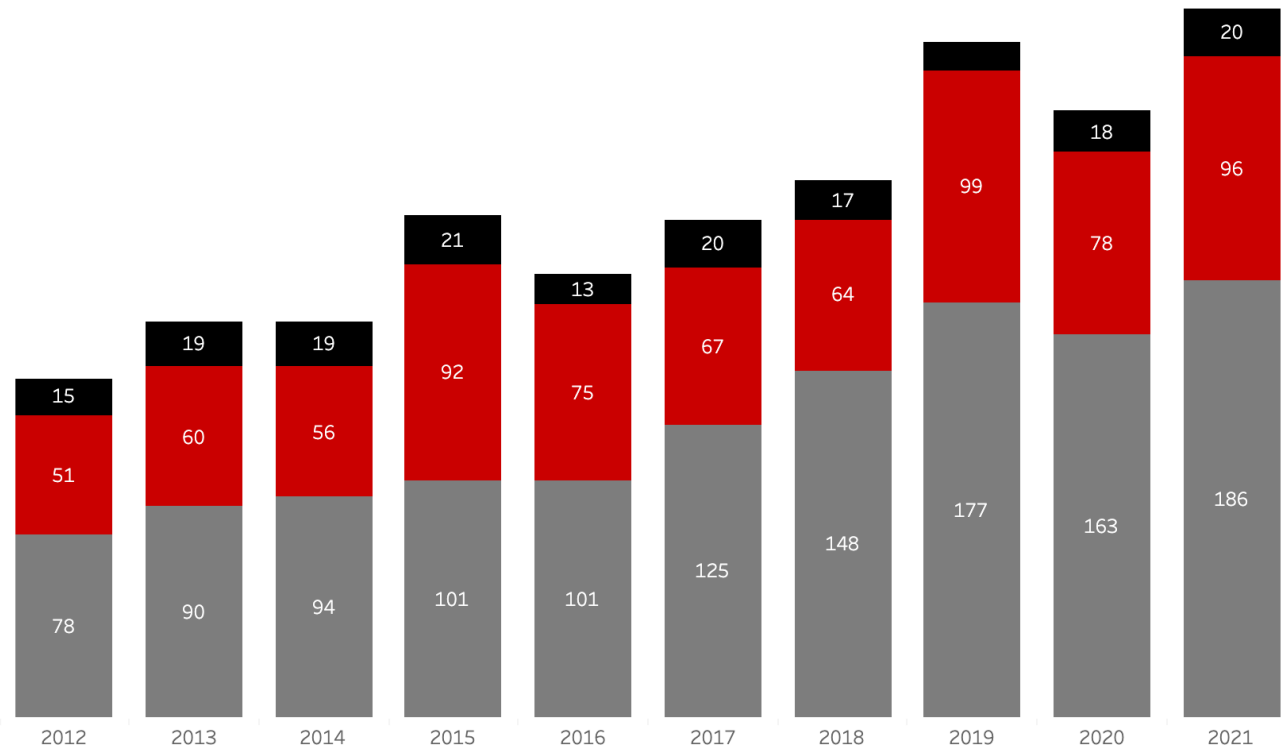
- School of Computing
 - Interdisciplinary computing research & education (**CS + ...**)
- Undergraduate degrees offered
 - Traditional CS degree
 - Computer Engineering, joint with ECE
 - Data Science (shares CS1, CS2, CS3) +
 - **In 2022: Software Development (shares CS1, CS2, CS3) +**
- Graduate degrees offered
 - BS/MS
 - Masters of Software Development
 - Master of Science in Computer Science
 - Master of Science in Computing w/Tracks
 - Data Mgmt&Analysis, HCC, Robotics, Graphics&Vis, Scientific Computing, Image Analysis, Computer Engineering, ...
 - PhD in Computer Science or Computing

+Both Data Science and Software Development require Ethics courses

2. Continued Growth

- CS is the #1 undergraduate major on campus
- U of U delivering **46%** of CS degrees in USHE
- BS CS Median Starting Salary **\$80,000**

Bachelors Masters Doctorate



3. Utah Center for Inclusive Computing



Center Launch, Sept. 1, 2021



Marissa Smith
Diversity & Outreach
Coordinator

- **Goal:** 30% women CS/DS/SD graduates by 2025
- **Today:** 16% of CS students are women, 8% are Latinx – below national averages for computing field
- \$700K from Pivotal Ventures via Northeastern University
- Regular meetings with external consultant, other universities

3. Interventions to Broaden Computing Participation

- Old CS1 pathways
 - **CS 1030**: CS0 course recommended for students with no experience and need for math preparation
 - **CS 1410**: Single CS1 course, Calc1 as co-requisite
- New CS1 pathways
 - **CS 1400+1410**: 2 semesters, no experience required
 - **CS 1420**: 1 semester, advertised as “accelerated”, and for students with prior programming experience
- Retention TAs
 - Spring 2021 pilot in CS2 and CS3
 - Work with at-risk students retaking classes or conditionally in the major, no other responsibilities
 - In Fall 2021, CS 1400 and CS 1420 retention TAs added

3. Early Results on New Pathways

Course	Enrolled	Women	Freshman	CS	CE	Premajor	Undeclared
F20 1410	465	20%	30%	40%	6%	66%	6%
F21 1400	345	21%	50%	46%	6%	79%	12%
F21 1420	371	17%	42%	48%	11%	68%	6%

- Growth in 2021
 - >50% more CS1 students in Fall 2021 than Fall 2020
- Some differences in demographics
 - Slight improvement in % women, higher rate of freshman and undeclared in CS 1400
 - This year's CS1 students are younger and more committed to CS than in 2020
- Retention TAs reduced withdrawal rate, improved outcomes

4. Clinical Capstone Pilot

- What is it
 - Industry partner works with undergraduate capstone team, typically 3 students
 - Proposes project idea to students, interested students apply, continued engagement
- Structured agreement
 - Organizations sign formal agreement (\$15,000) for scholarships, mentor, materials, awards
 - Students sign Intellectual Property agreements
 - Graduate student mentor assigned
 - Regular team meetings over two semesters
 - Primary deliverables are demonstration and written report
 - Senior Capstone Demo Day in April

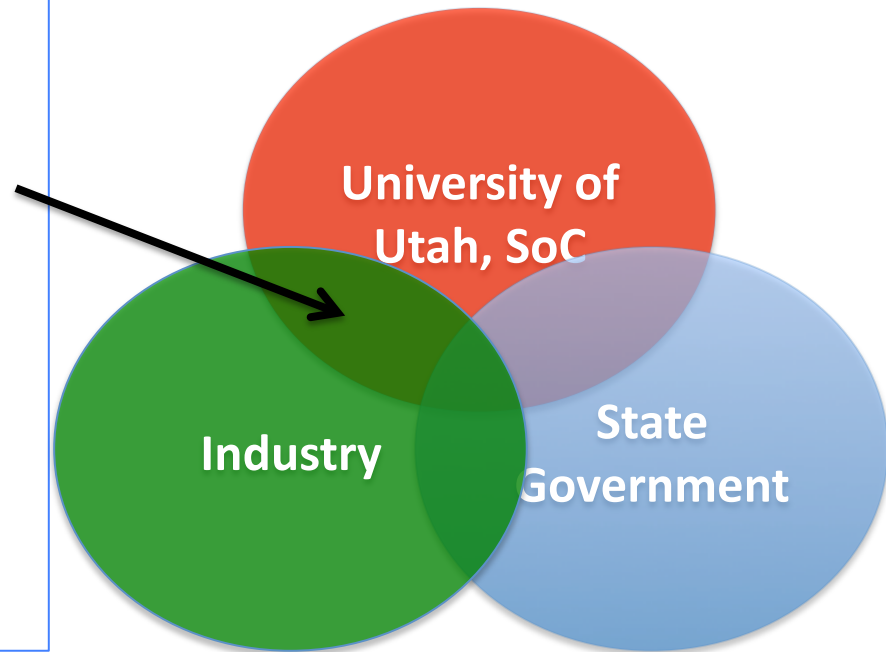
4. 2021 Pilot Projects

L3 Harris Technologies

- Cybersecurity using Knowledge Graphs and Graph Neural Networks

Idaho National Laboratory

- Development of an Interactive Resiliency Index Tool



Interested? Plan to expand to 4 projects in 2022

Also, Masters Capstones for MSD and new Deep Tech Certificates with different structures

5. Workforce-Related Masters Programs

Areas for Workforce Development

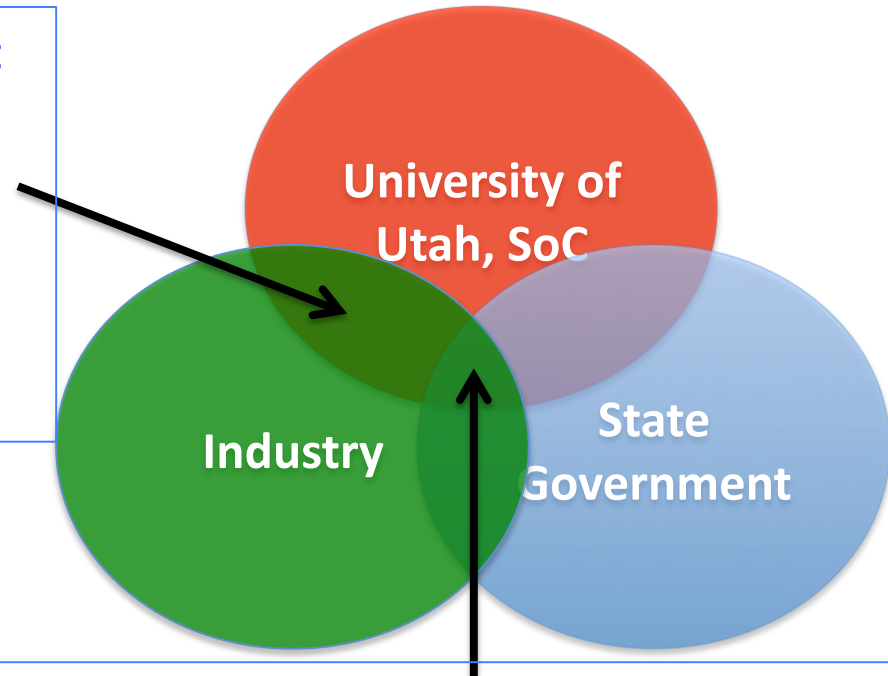
Utah Center for Data Science

(Director: Phillips)

Human-Centered Computing

(Presenter: Wiese)

Financial Technology (Future)



Deep Tech Initiative, selected by USHE

Bringing Fairness in AI to Forefront of Education (PI: Wang Phillips + Business, \$343K)

Deep Learning Certificate in AI and Robotics (PI: Tom Henderson, \$416K)

Graduate Certificates in Secure Computing (PI: Sneha Kasera, \$671K)

6. Agenda Overview

2021

THE UNIVERSITY OF UTAH
SCHOOL OF COMPUTING
ADVISORY BOARD

12:00 PM **Arrival, pick up lunch**

12:10 PM **Welcome**

Mary Hall
Professor & Director, School of Computing
Introductions: All attendees

12:20 PM **State of the School**

Mary Hall
Professor & Director, School of Computing

Growth, Inclusion, Pathways through Undergraduate Program, Workforce Needs, Senior Clinical Capstone Pilot Program, and Agenda Overview

12:50 PM

Faculty Panel Discussion:

Skilled Workforce to Meet Utah Needs:

1. Jason Wiese, Human-Centered Computing
2. Bei Wang, AI and Fairness
3. Tom Henderson, Machine Learning
4. Sneha Kasera, Cybersecurity
5. Jeff Phillips, Data Science

1:20 PM

Discussion

1:40 PM

New School of Computing Building

Richard Brown
Dean, College of Engineering

Josh Grant
Executive Dir., Development and External Relations

2:10 PM

Discussion

2:30 PM

Adjourn

COMPUTE

Questions for Discussion

1. Across all areas of computing, what are the important things an incoming developer should know? Please consider both technical knowledge and practical skills. If you believe that there are gaps in our programs, please help us identify them.
2. Of the different certificates and Masters programs described – Human-Centered Computing, Fairness in AI, Deep Learning in AI & Robotics, Cybersecurity, Data Science – which of these apply to your organization?
3. From the perspective of your organization, what are ways in which you currently interact with the School of Computing? What are future interactions that would be of interest to your organization?
4. What are ways in which the university, industry and government might collaborate to build technology in Utah?