

# ***Welcome to U of U Engineering Day***



***Price College of Engineering***



# ***What is an Engineer?***

- *A Foundation of Science*
  - *Math*
  - *Physics*
  - *Chemistry*
- *The Creativity of Art*

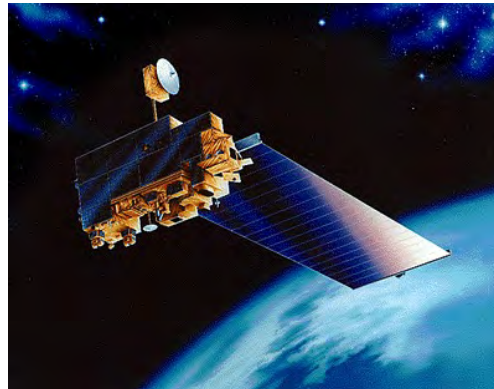
*"Scientists discover the world that exists;  
Engineers create the world that never was."*

*—Theodore von Kármán, Aerospace Engineer*



# *Engineers and Computer Scientists*

- *Serve Humanity by Improving Quality of Life*
  - *Tools for Scientific Exploration*
  - *Communications*
  - *Infrastructure*
  - *Environment*
  - *Entertainment*

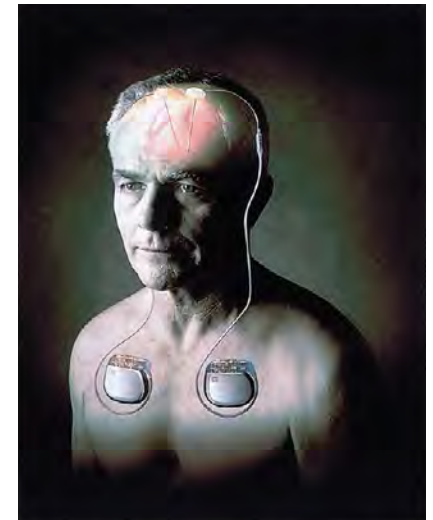






# *Engineers and Computer Scientists*

- *Serve Humanity by Improving Quality of Life*
  - *Energy Availability and Efficiency*
  - *Productivity*
  - *Safety*
  - *Healthcare*







# Departments and Programs

**Biomedical Engineering**

**Civil and Environmental Engineering**

**Nuclear Engineering (Minor, MS, PhD)**

**Construction Engineering (BS, MS)**

**Chemical Engineering**

**Mechanical Engineering**

**Electrical and Computer Engineering**

**Computer Engineering (BS)**

**School of Computing, Computer Science, Computing**

**Data Science (BS)**

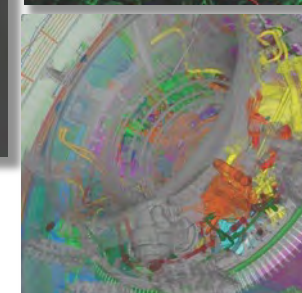
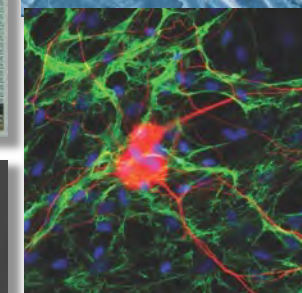
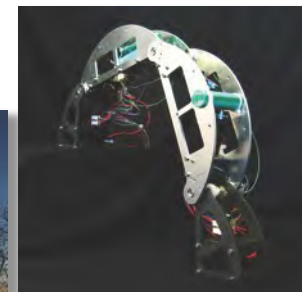
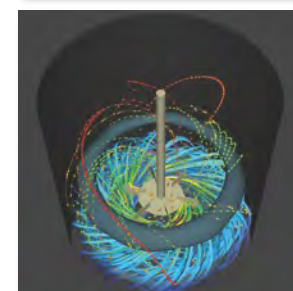
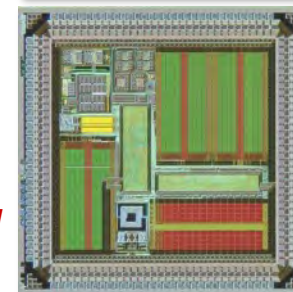
**Software Development (BS, MS)**

**Materials Science and Engineering**

**Metallurgical Engineering**

**Mining Engineering**

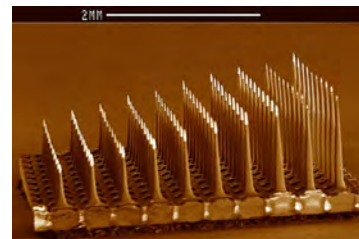
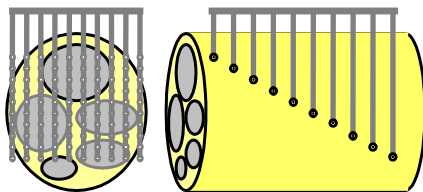
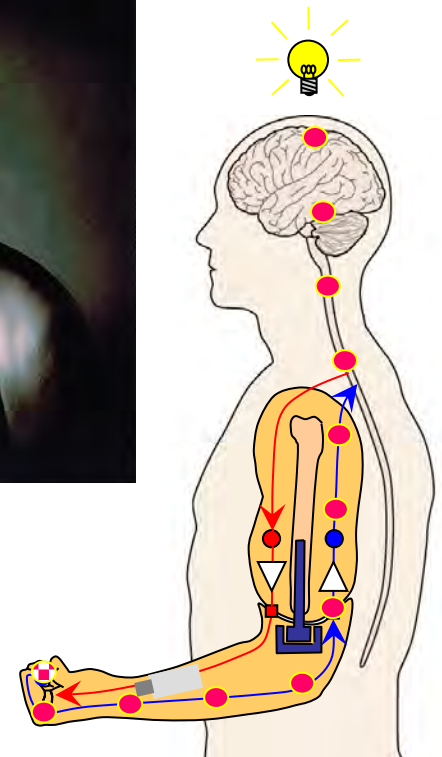
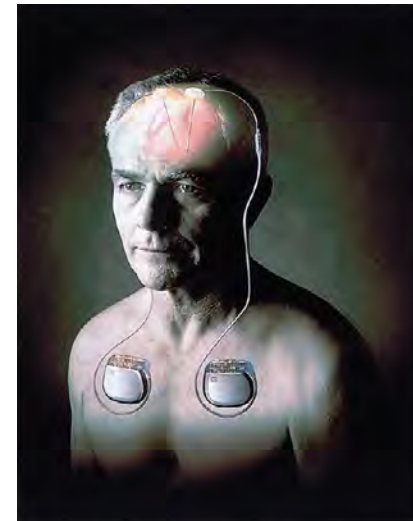
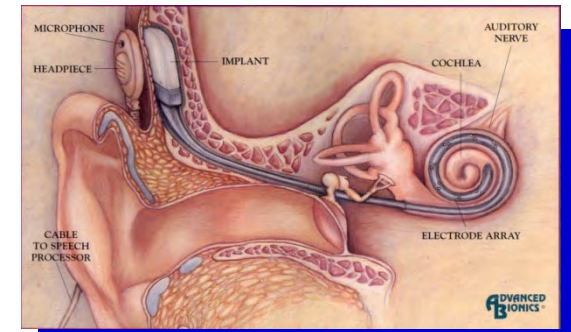
**Geological Engineering**





# Biomedical Engineering

- *Biomedical Implants*
  - *Pacemakers*
  - *Hips and Knees*
- *Biomedical Sensors*
- *Artificial Organs and Limbs*
- *Tissue Engineering*
- *Depression Treatment*
- *Pre-med*



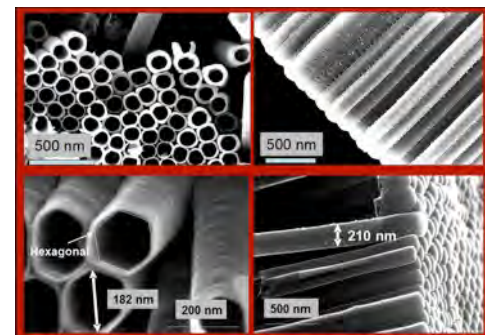


# Chemical Engineering

- *Sustainable Energy*
- *Air Quality and Environment*
- *Materials and Nanotechnology*
- *Biotechnology and Medical Devices*
- *Smart Chemical Processes*
- *Petroleum Engineering*
- *Multiscale Computational Simulation*



[airu.coe.utah.edu](http://airu.coe.utah.edu)







# ***Civil and Environmental Engineering***

- *Environmental*
- *Geotechnical*
- *Structural Engineering*
- *Transportation*
- *Water and Water Quality*
- *Construction Engineering*







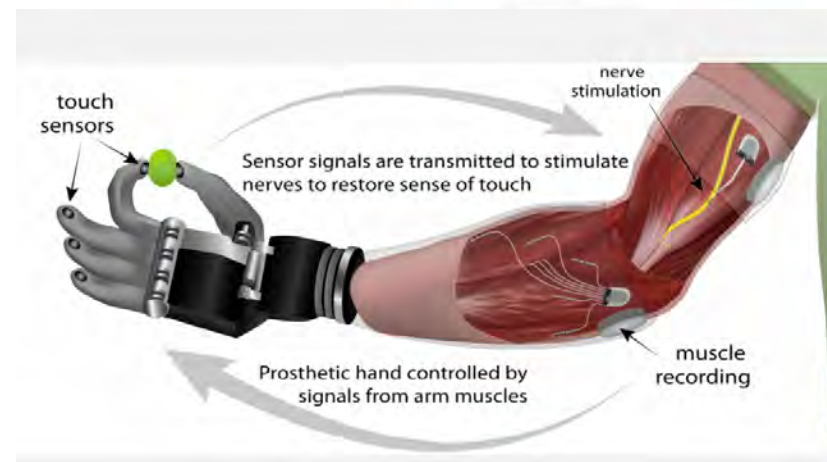
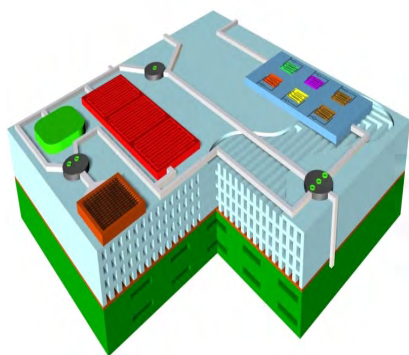
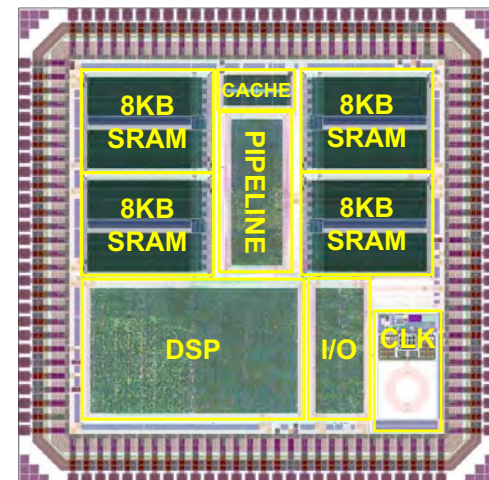
# CvEE Job Fair





# ***Electrical and Computer Engineering***

- *Computer and Microprocessor Design*
- *MicroElectroMechanical Systems (Sensors)*
- *Communications and Electromagnetics*
- *Image and Signal Processing*
- *Power and Control Systems*
- *Semiconductors*
- *Robotics*
- *Optics*

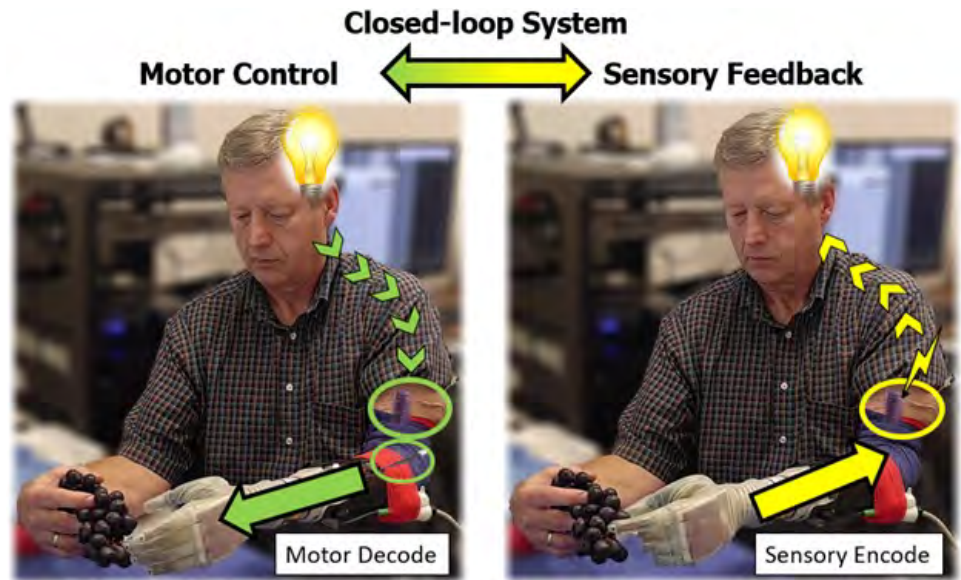
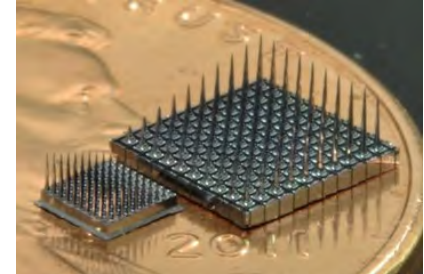






# Medical Applications of ECE

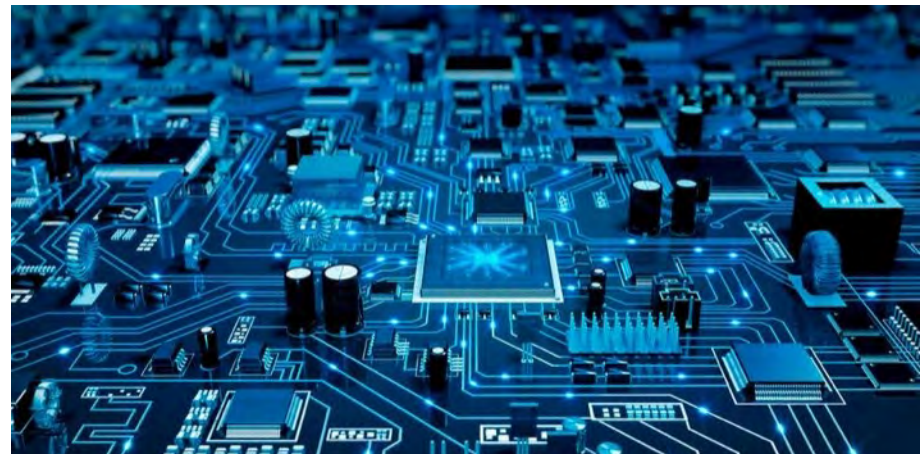
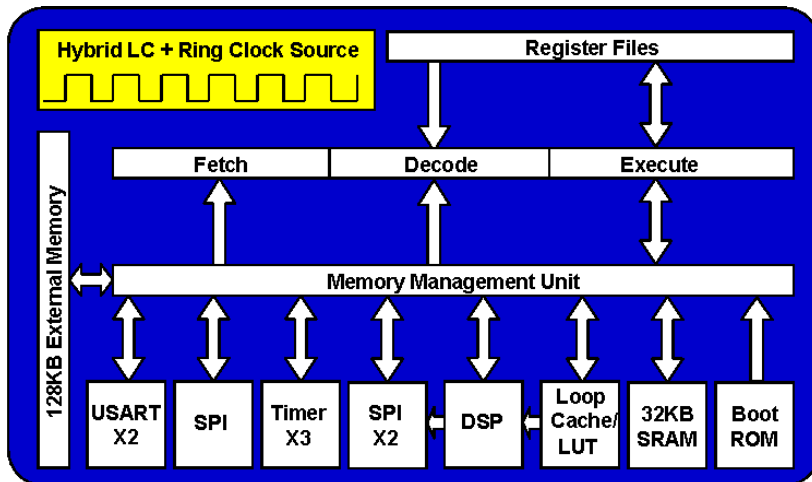
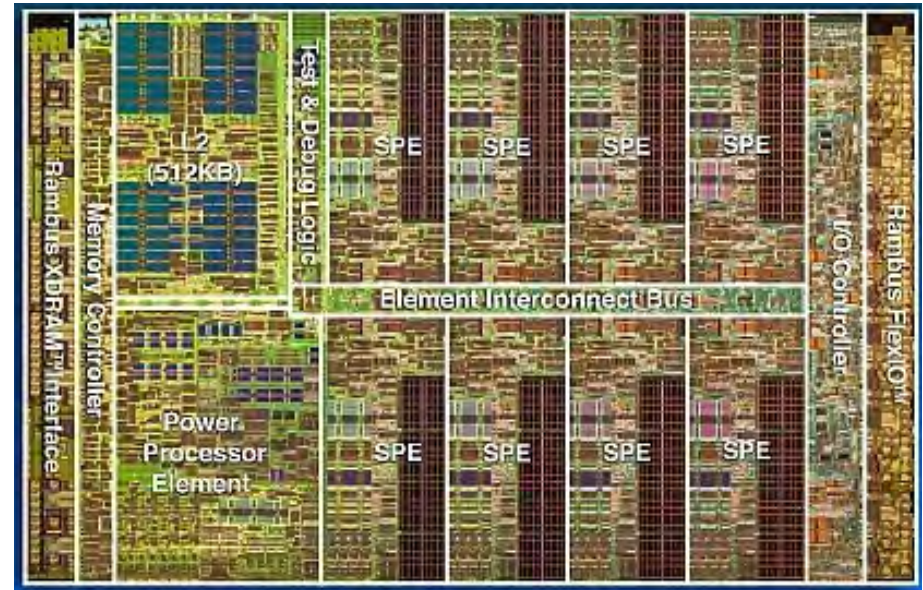
- Jacob A. George
- *The Force is with U: Turning Luke Skywalker's Bionic Arm from Sci-Fi Dream to Real-World Impact*





# Computer Engineering

- *Digital Circuits*
- *Computer Architecture*
- *Computer Systems*
- *System Software*
- *Networks*







# Computer Science

- *Software*
- *Artificial Intelligence/Machine Learning*
- *Computer Applications*
- *Computer Graphics*
- *Databases*
- *Human-Computer Interfaces*
- *Data Science and Analytics*
- *Cybersecurity*
- *FinTech*
- *Robotics*
- *Games Track*







# *Pioneers of Computer Graphics*





# ***Materials Science and Engineering***

- *Nanotechnology*
- *Battery Technology*
- *Fuel Cells*
- *Environmentally Friendly Materials*
- *Electronic Materials*
- *Biomedical Materials*
- *Extractive Metallurgy*

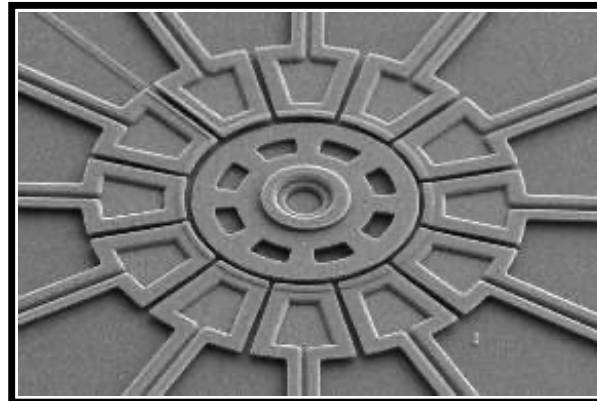
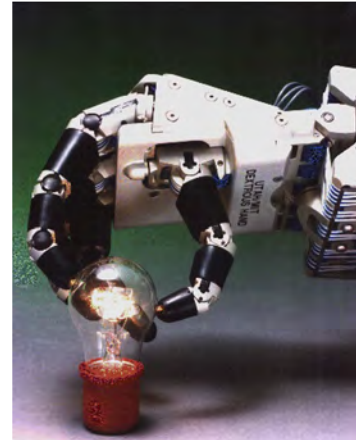






# ***Mechanical Engineering***

- *Machines*  
*Design, Development and Manufacturing*
- *Robotics*  
*Autonomous Vehicles*  
*Artificial Limbs*
- *Drones*
- *Composite Materials*
- *Fluidics*







# ***Nuclear Engineering Minor***

- *Nuclear Power Plant Design and Operation*
- *Nuclear Medicine (Medical Isotope Production)*
- *Electronics Testing*
- *Nuclear Forensics*
- *Industrial Testing*
- *Food Safety*





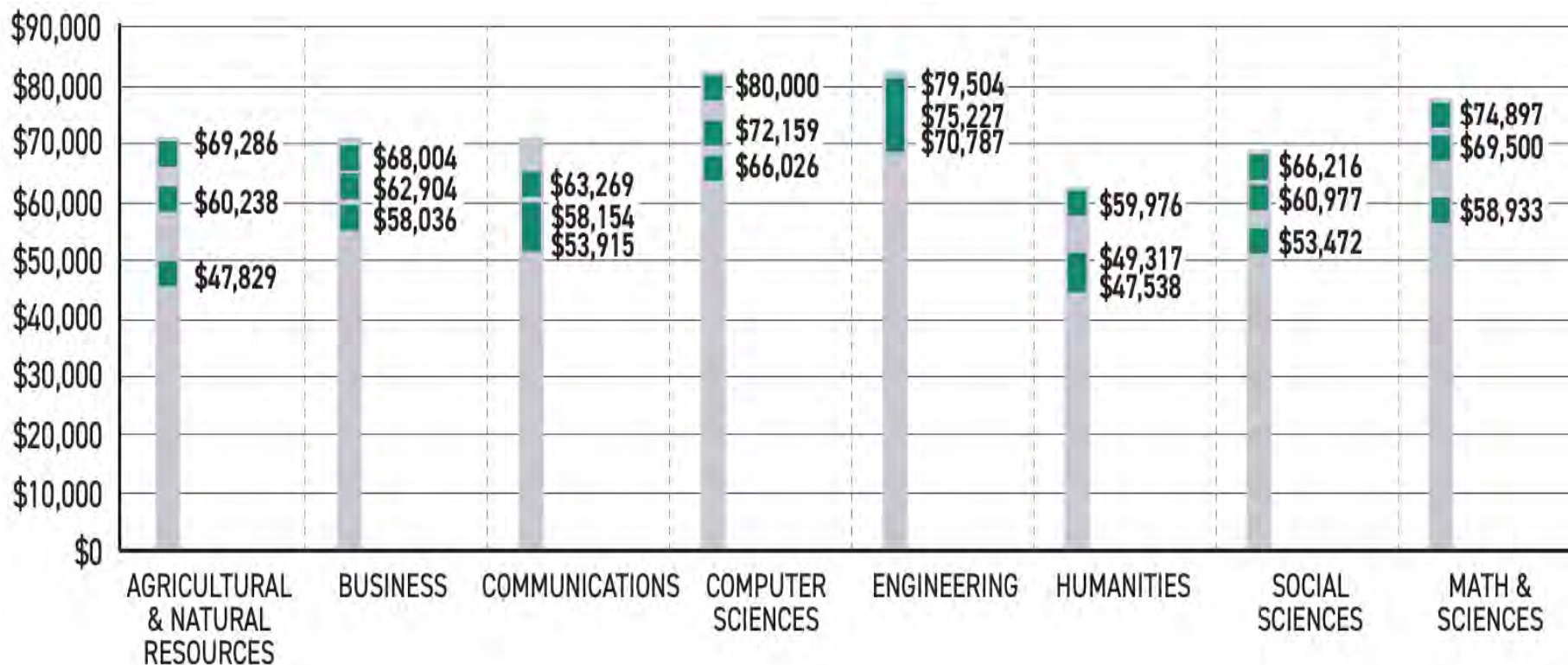
# *Mining Engineering*

- *Critical Materials*
- *Career Paths*
  - *Mine operations and planning*
  - *Environmental engineering*
  - *Consulting firms*
  - *Government agencies*
  - *Project management*
- *mining.utah.edu*





# 2023 Bachelors Starting Salaries

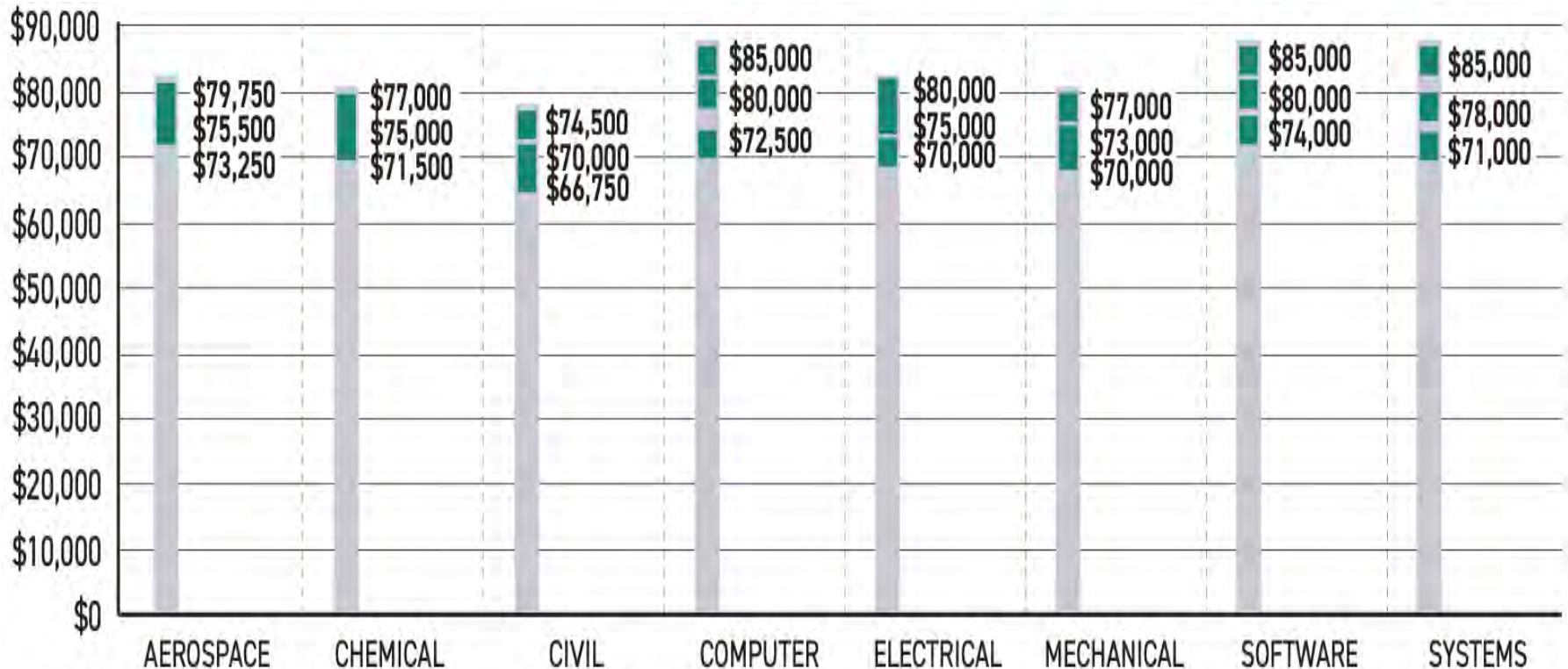


National Association of Colleges and Employers, *Winter 2023 Salary Survey*





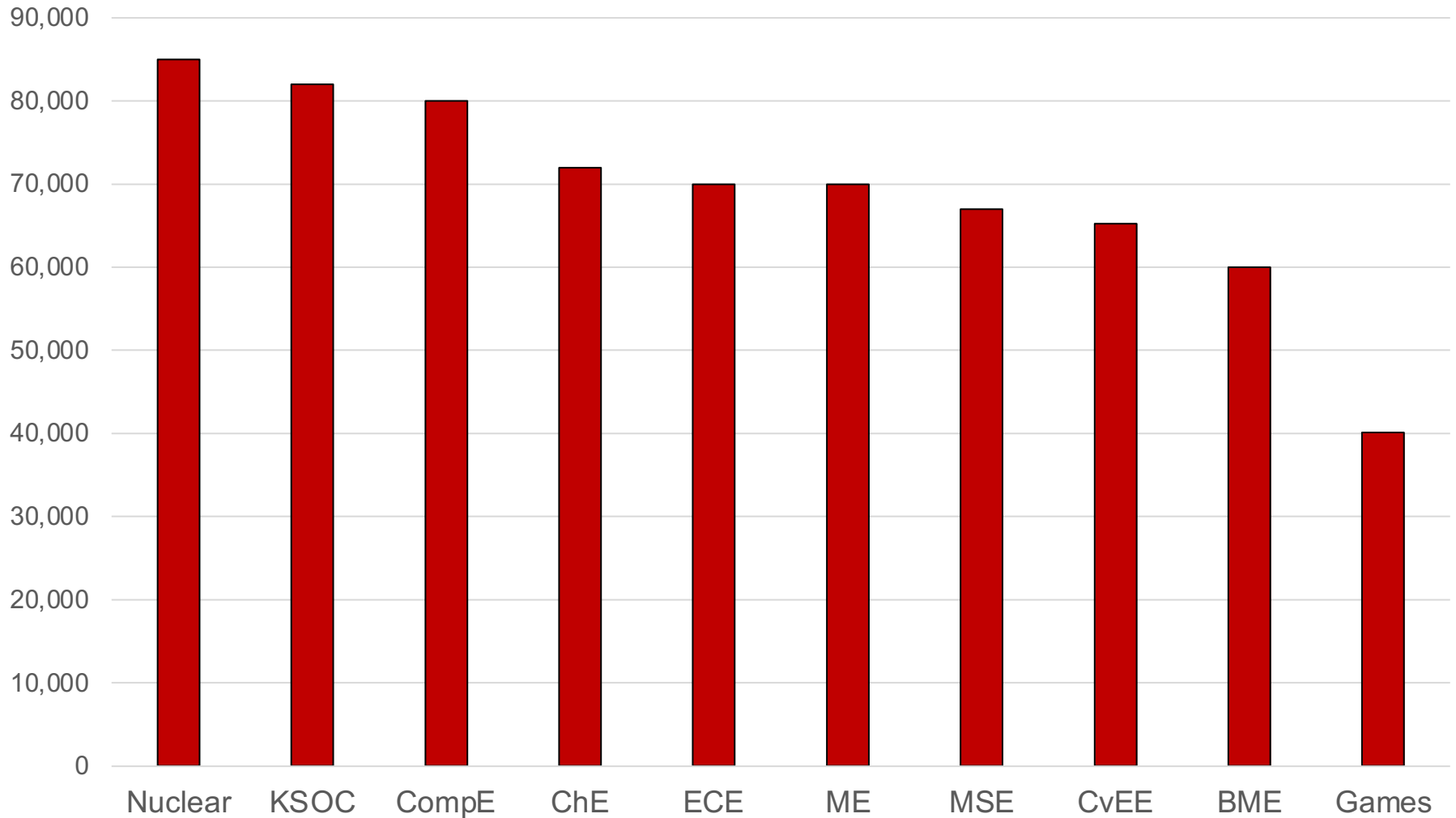
# 2023 Bachelors Starting Salaries



National Association of Colleges and Employers, *Winter 2023 Salary Survey*



# ***Median Bachelors Starting Salaries***



University of Utah Careers Center Data for 2020-23



# University of Utah

- *Flagship University*
  - *Utah's Premier Tech University*
- **34,349** students
- **18** colleges, **100** majors
  - *Engineering, Medicine, Law, Business*
  - *World-class research facilities*
  - *Museums, Concert Venues and Theaters*
- *Carnegie Classification* **R1**
- **\$768M** Sponsored Project Awards
- **PAC-12** athletics moving to **BIG-12**
- *Association of American Universities*



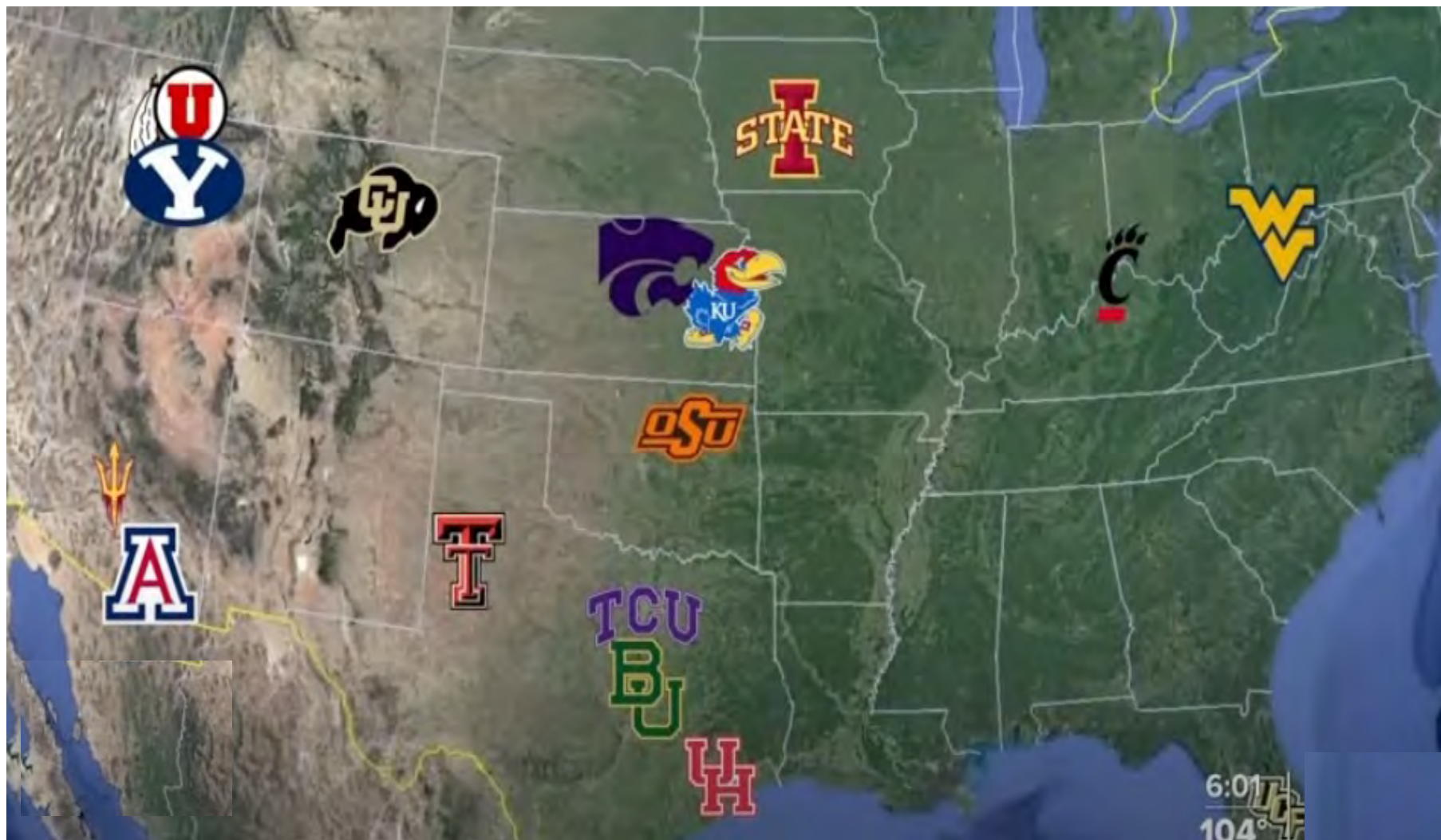
Association  
of American  
Universities







# BIG-12 Conference





# *Why the University of Utah?*

- *Wall Street Journal – 11<sup>th</sup> in Value*
- *Make the Most of your Abilities*
- *Salaries from Selective Colleges earn 20% More (Reuters)*
- *Your Degree is Worth More*
  - *Work for any company. Attend any graduate school.*







# Wall Street Journal Ranking

	University	Tuition	Value Added to Salary
1	University of Florida	\$3,679	\$44,468
2	New Jersey Institute of Technology	\$17,093	\$56,495
3	University of Michigan	\$17,086	\$54,580
4	Florida International University	\$6,232	\$32,946
5	University of Illinois	\$15,483	\$50,368
6	Texas A&M	\$20,976	\$44,877
7	Georgia Tech	\$14,820	\$71,375
8	University of Utah	\$12,867	\$34,456



# *Why the University of Utah?*

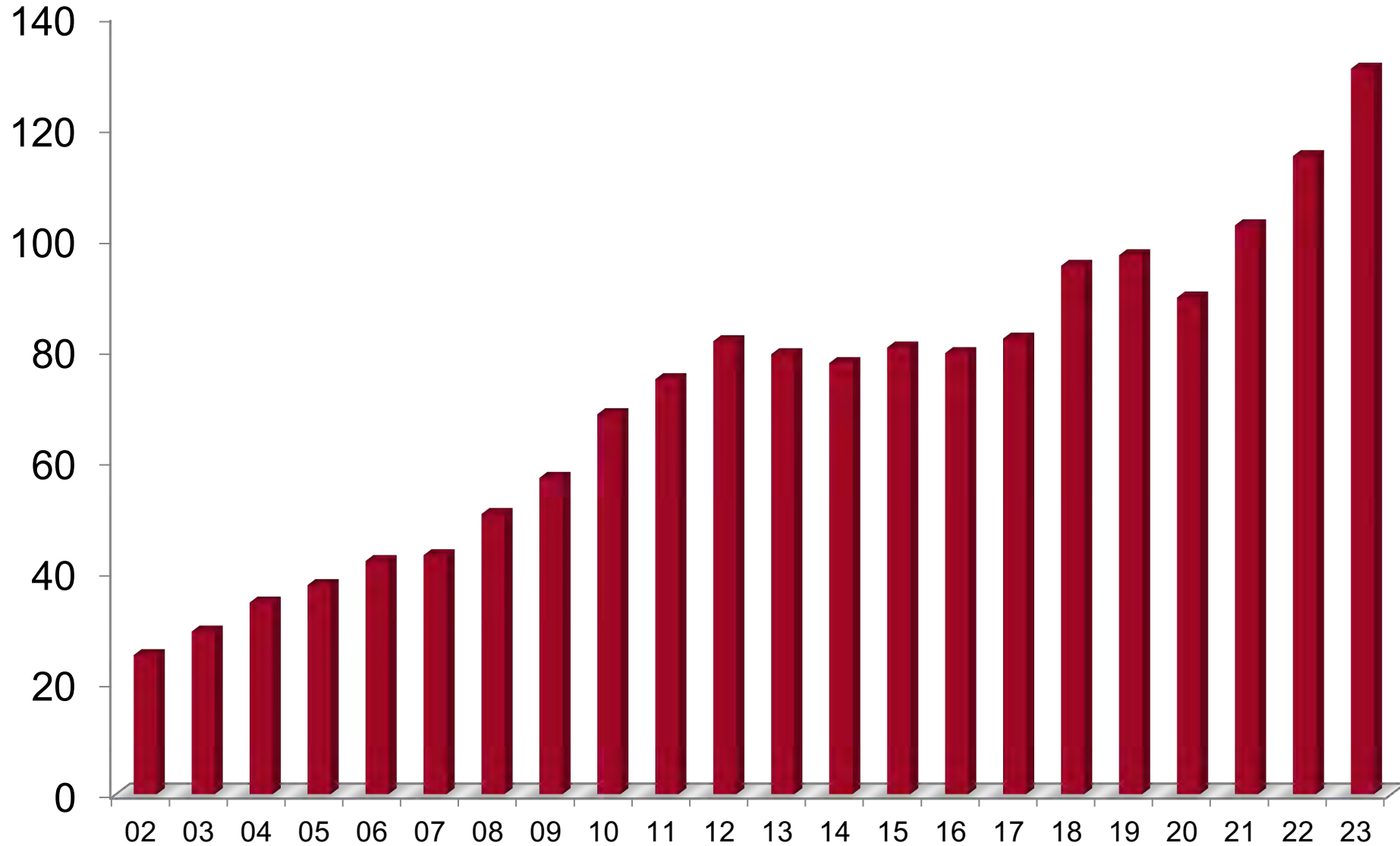
- *Research University*
  - *Leading Edge Faculty (all with terminal degrees)*
  - *Seminars*
  - *Graduate Students*
  - *Laboratories and Equipment*
- *Signature Experiences*
  - *Senior Capstone Projects*
  - *Undergraduate Research*
- *Rich Curriculum*
  - *220 Faculty*
  - *684 Courses per year*







# *Engineering Research Expenditures*





# *High School Research Internship*

- *Work in an Engineering/Computing Research Lab*
  - *8 Weeks in the Summer*
  - *30 Hours per week*
- *No Cost for Program*
- *Submit your Research Project to Utah Science and Engineering Fair*
- *Applications Accepted December – January*
- *For Students who Graduate High School in 2024 or 2025*





# *Engineering Scholars*

A banner image for the Engineering Scholars Program. On the left, a young man with dark curly hair and a beard, wearing a light purple button-down shirt, is smiling and holding a small electronic device with wires. The background is a blurred workshop or lab. On the right, the text 'ENGINEERING SCHOLARS PROGRAM' is written in large, bold, white capital letters. Below this, the website 'esp.utah.edu' is shown in white, followed by a large black 'U' logo. The entire banner has a red and black geometric design on the right side.

## ENGINEERING SCHOLARS PROGRAM

[esp.utah.edu](http://esp.utah.edu)



- *Research Lab and Company Tours*
- *Seminars and Workshops*
- *Research or Capstone Project Team*
- *Peer Mentoring and Social Events*
- *Internships*



# ***Facilities: Sorenson USTAR Building***







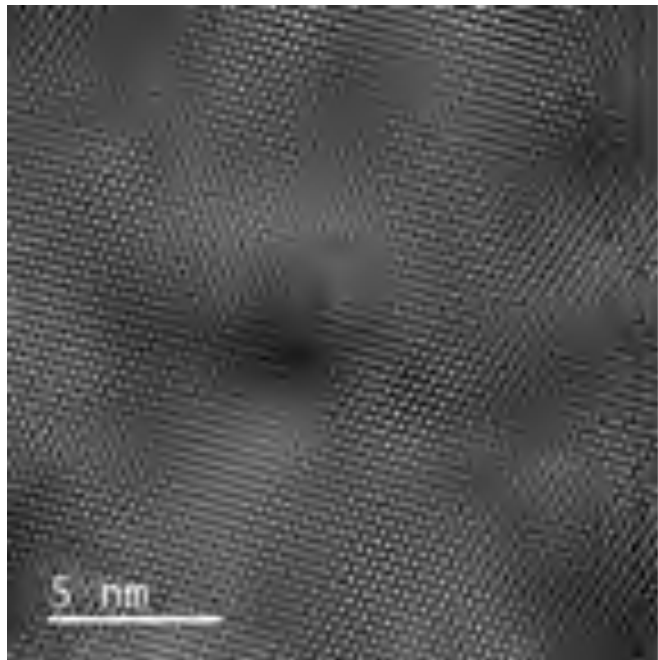
# ***Nanofabrication Laboratory***







# ***USTAR Microscopy Core Facility***







# ***Price Computing & Engineering Bldg.***







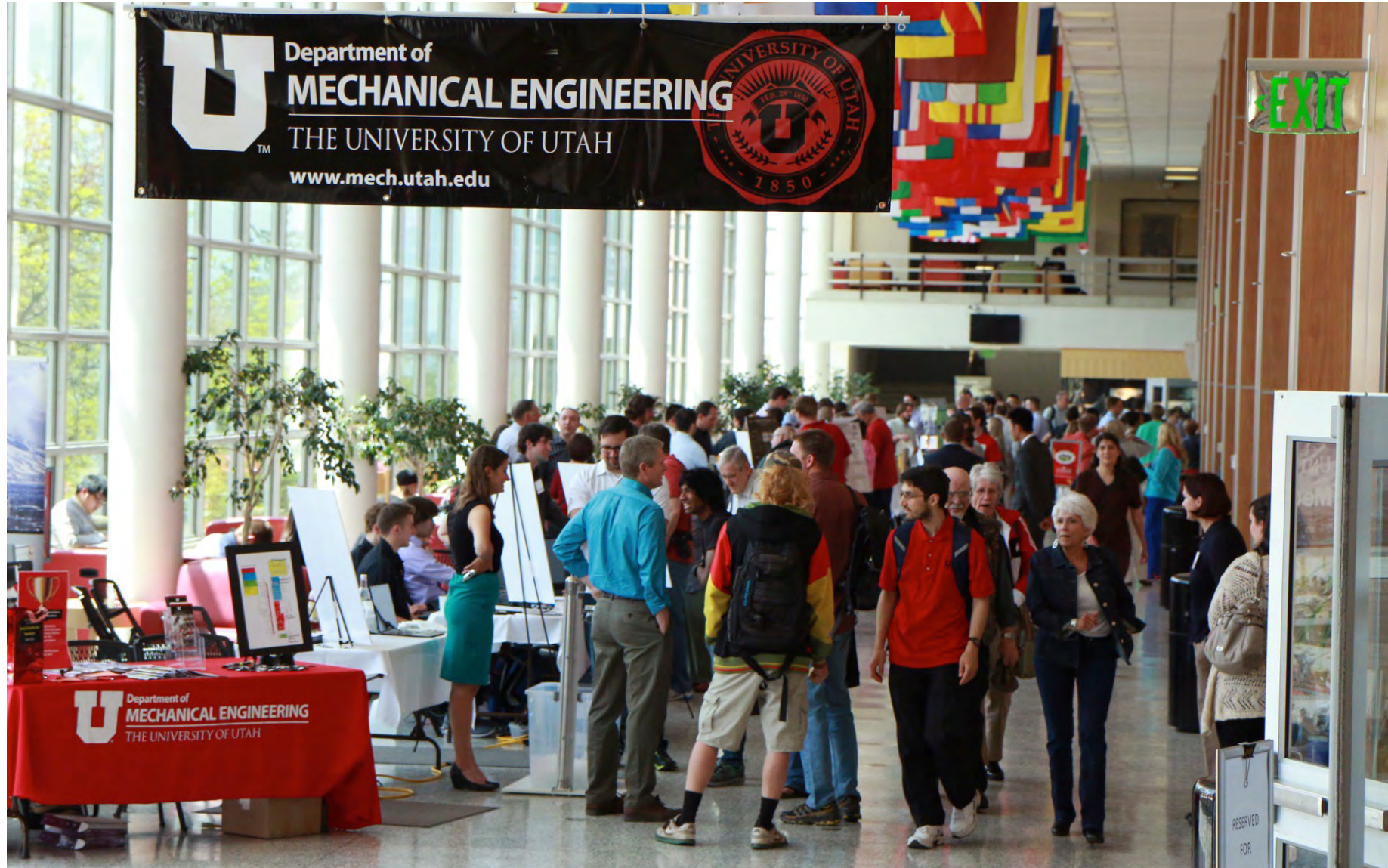
# ***Price Computing & Engineering Bldg.***





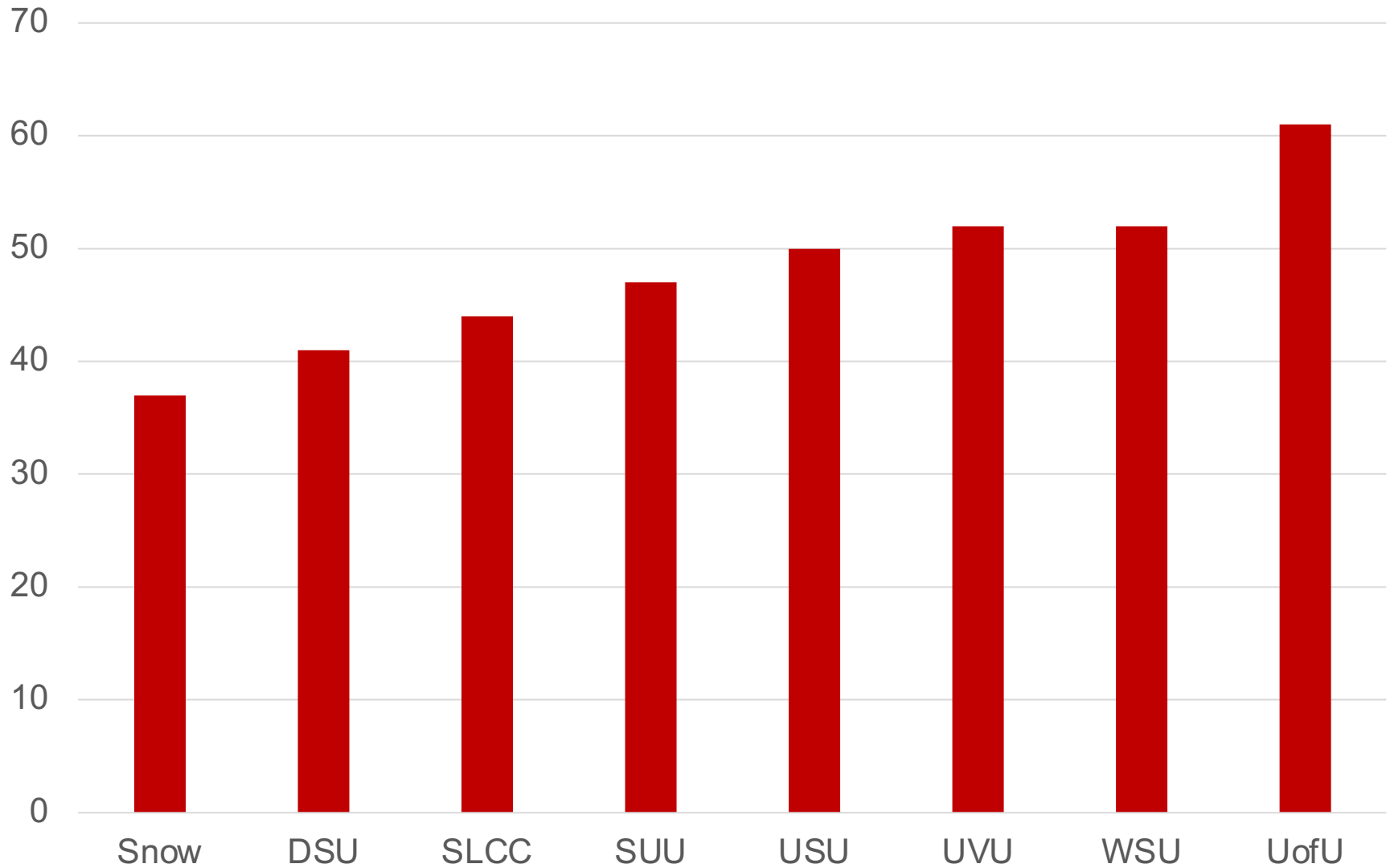


# *Senior Capstone Projects*



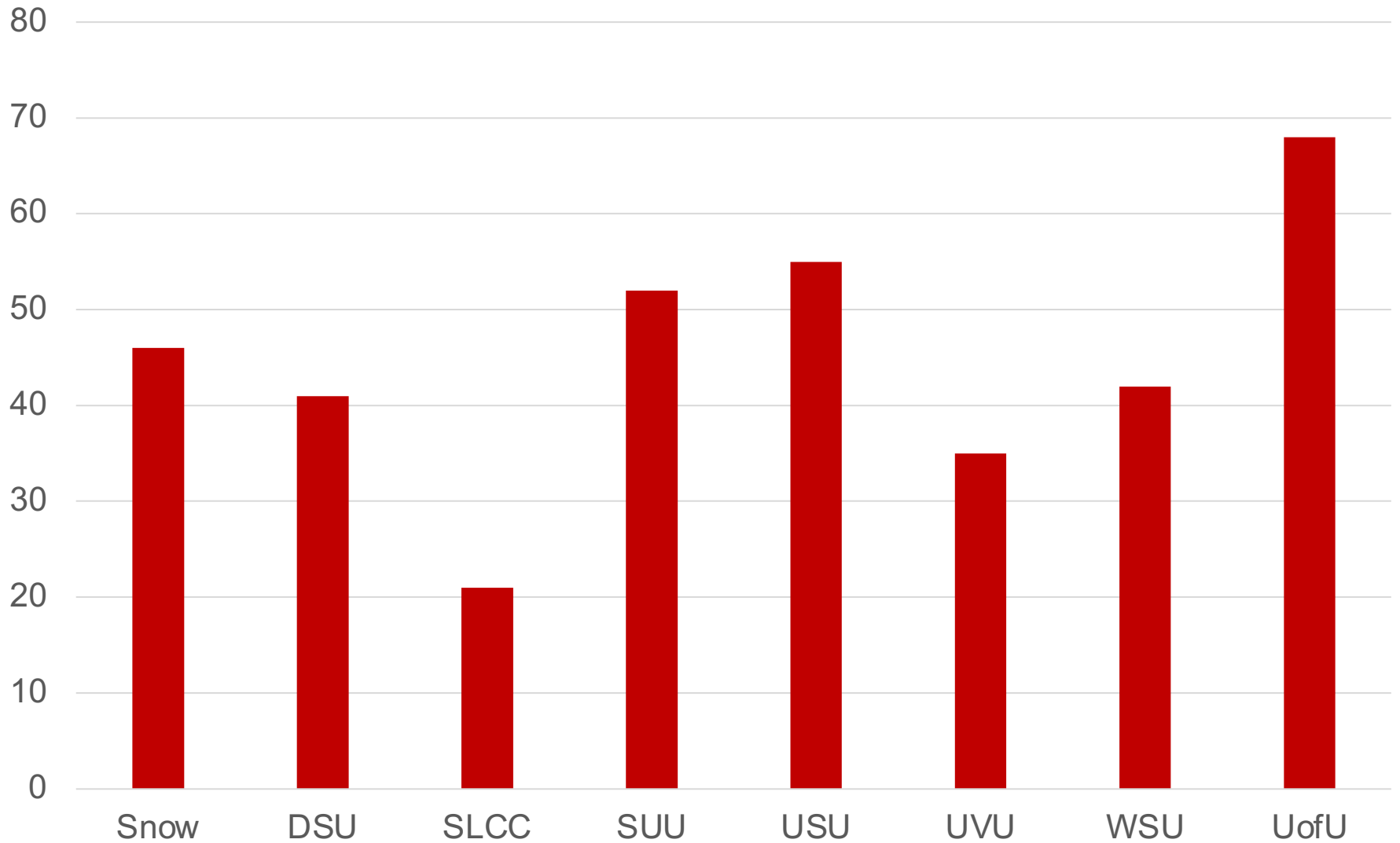


# *Average Salary (University-wide)*





# *Graduation Rate*







# ***Notable Alumni***



**Simon Ramo, TRW**



**John Warnock, Adobe**



**Gretchen McClain, NASA**



**Ed Catmull, Pixar**



**Mark Fuller, WET Design**



**Jim Clark, Netscape, Silicon Graphics**



# *Lassonde Entrepreneur Dormitory*



400 Beds

20,000 sq.ft. of “Garage”

Interdisciplinary





# *Ivory University House*



536 Beds Opened Fall 2023





# ***International Exchange Program***

- ***Partner Universities***

## ***China***

*Tsinghua*

*Shanghai Jiao Tong Universities*

*Hong Kong University of Science and Technology*

*National Taiwan University*

## ***Korea***

*Seoul National University*

## ***Germany***

*Technical University of Berlin*

*Saarland University*

## ***India***

*IIT Kharagpur*

## ***Brazil***

*University of São Paulo*





# ***Grand Challenges Scholar Program***



Efficient Solar Energy



Energy from Fusion



Carbon Sequestration



Manage Nitrogen Cycle



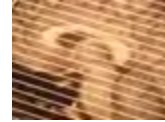
Improve Urban Infrastructure



Access to Clean Water



Healthcare Informatics



Reverse Engineer the Brain



Engineer Better Medicines



Prevent Nuclear Terror



Secure Cyberspace



Enhance Virtual Reality



Advance Personal Learning



Engineer Tools of Discovery



# Engineering Clubs

- *Engineers Without Borders*
- *Nonprofit Humanitarian Organization*
- *Infrastructure Projects*
  - *Water*
  - *Energy*
  - *Sanitation*







# *U of U was #1 in Entrepreneurship*



- *Milken Institute Report*
  - *Patents Issued*
  - *Technology Licenses*
  - *Licensing Income*
  - *Startups Founded*

*“The [University of Utah] has quietly evolved into one of the most prestigious research universities in the United States with a strong emphasis on commercializing its research.”*

- *100+ Spinout Companies since 2006*



# *Engineers in the Executive Suite*

- *S&P 500 CEOs*
  - *33% have Engineering Undergrad Degrees*
  - *11% have Business Administration Degrees**(SpencerStuart)*
- *“Engineering skills include analytical thinking and problem solving, which are essential for being in a leadership position.”*
- *“Engineers who can combine their analytical and critical thinking skills with strong communication ability can be a powerful asset when it comes to top-level decision making.”*

*(Kelton Global)*





<i>The Business of Entrepreneurship</i>	<i>3 hr</i>	<i>ENGIN 5790</i>
<i>Launching Technology Ventures</i>	<i>3 hr</i>	<i>ENGIN 5791</i>
<i>Entrepreneurship Capstone</i>	<i>3 hr</i>	<i>ENGIN 5020</i>
<i>Patent Law &amp; Strategy</i>	<i>3 hr</i>	<i>ENGIN 5030</i>
<i>Technical Communications</i>	<i>3 hr</i>	<i>CLEAR</i>
<i>Capstone Project or Thesis</i>	<i>5 hr</i>	<i>Department Specific</i>



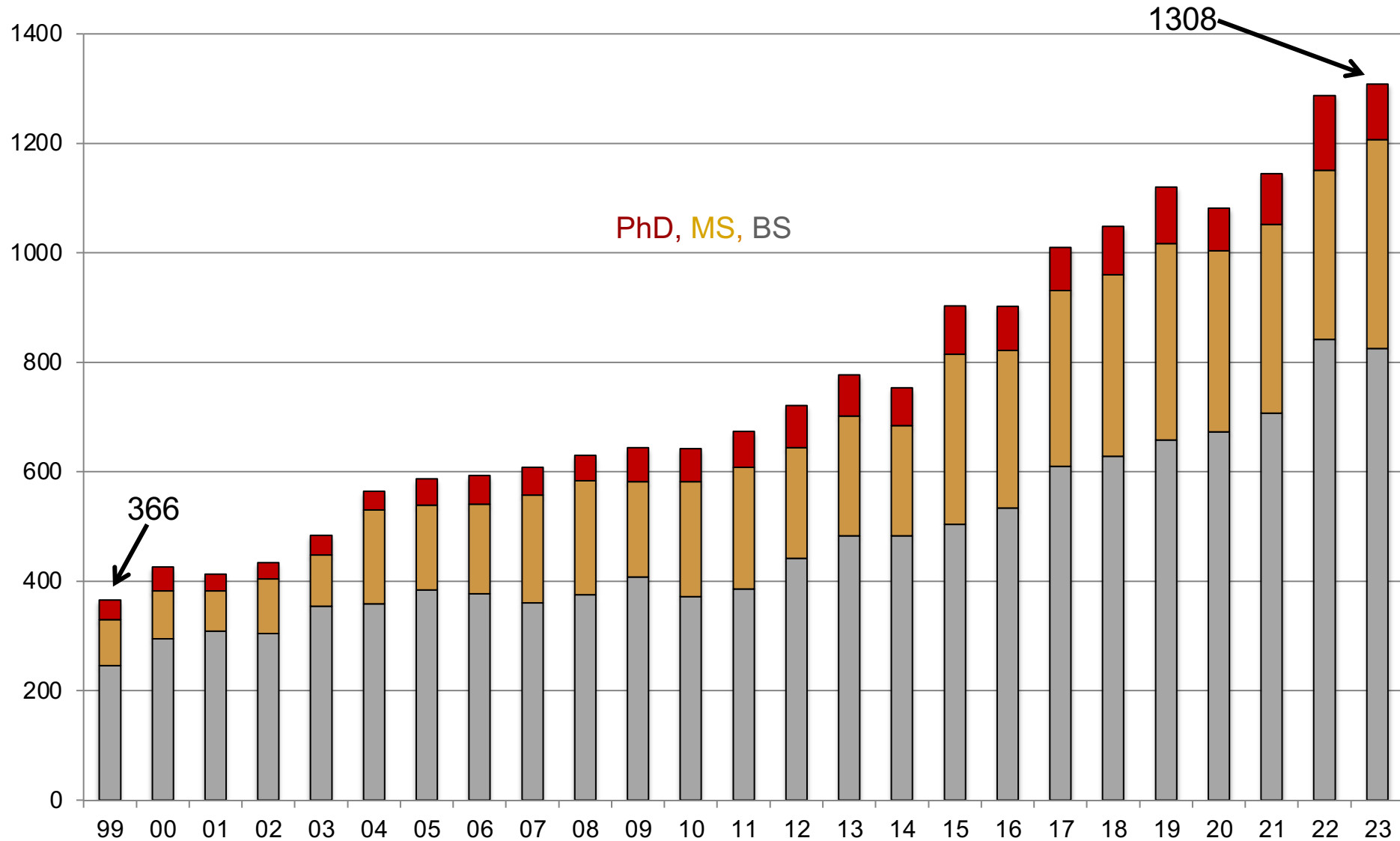
# *Honors Program*





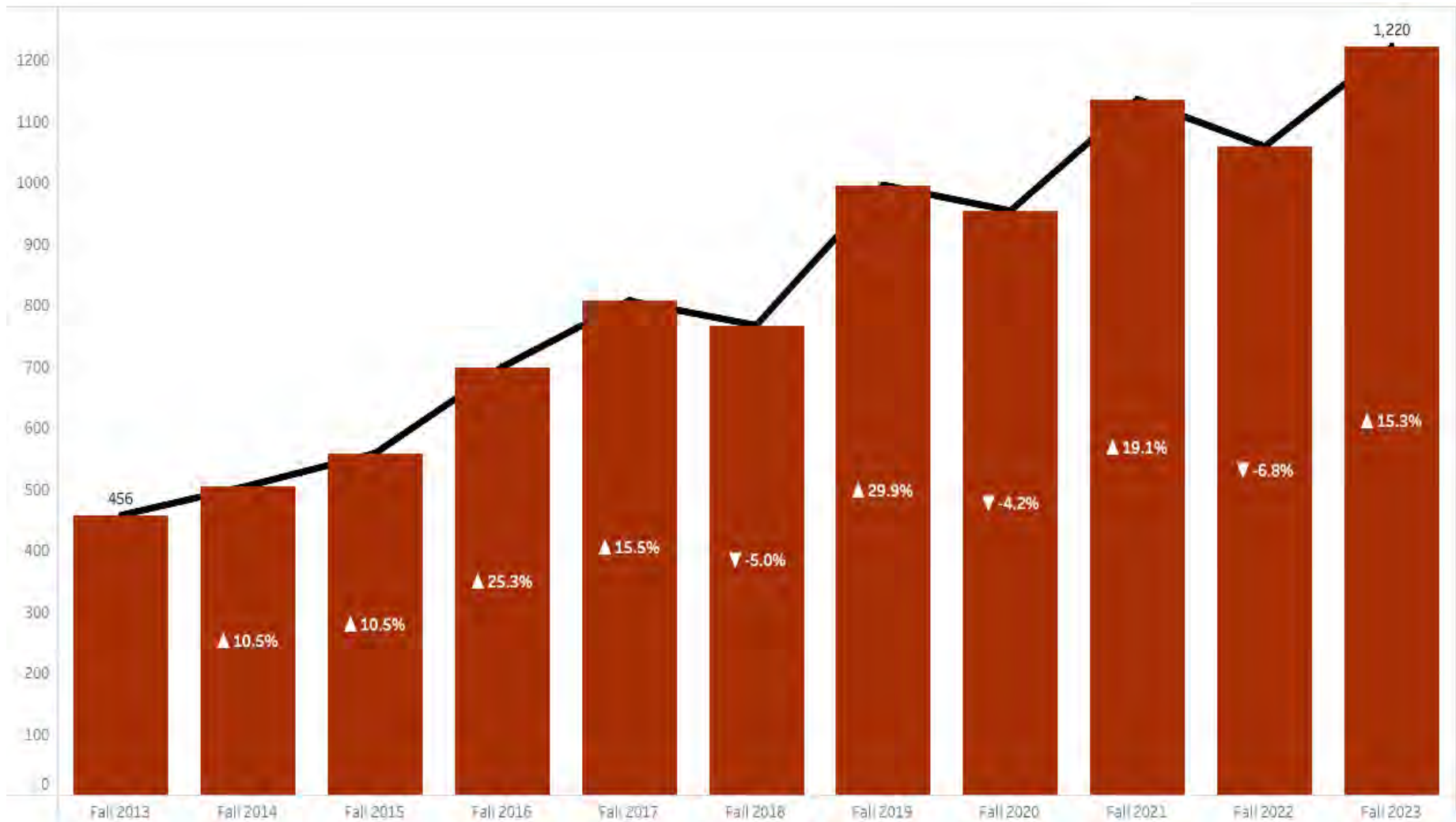


# Engineering Degrees





# *PCE Freshman Class Size*



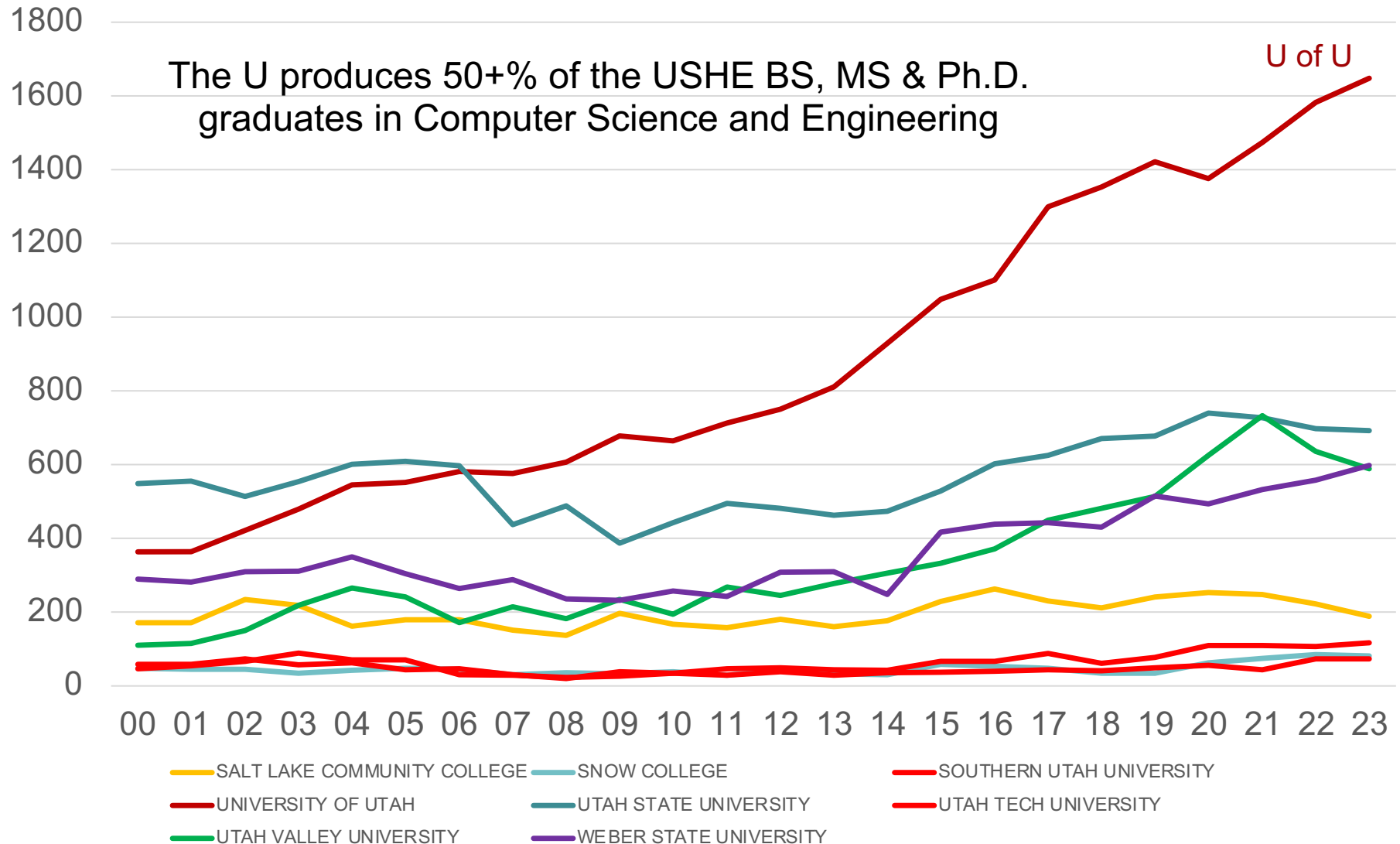




# USHE Engineering & CS Graduates

The U produces 50+% of the USHE BS, MS & Ph.D. graduates in Computer Science and Engineering

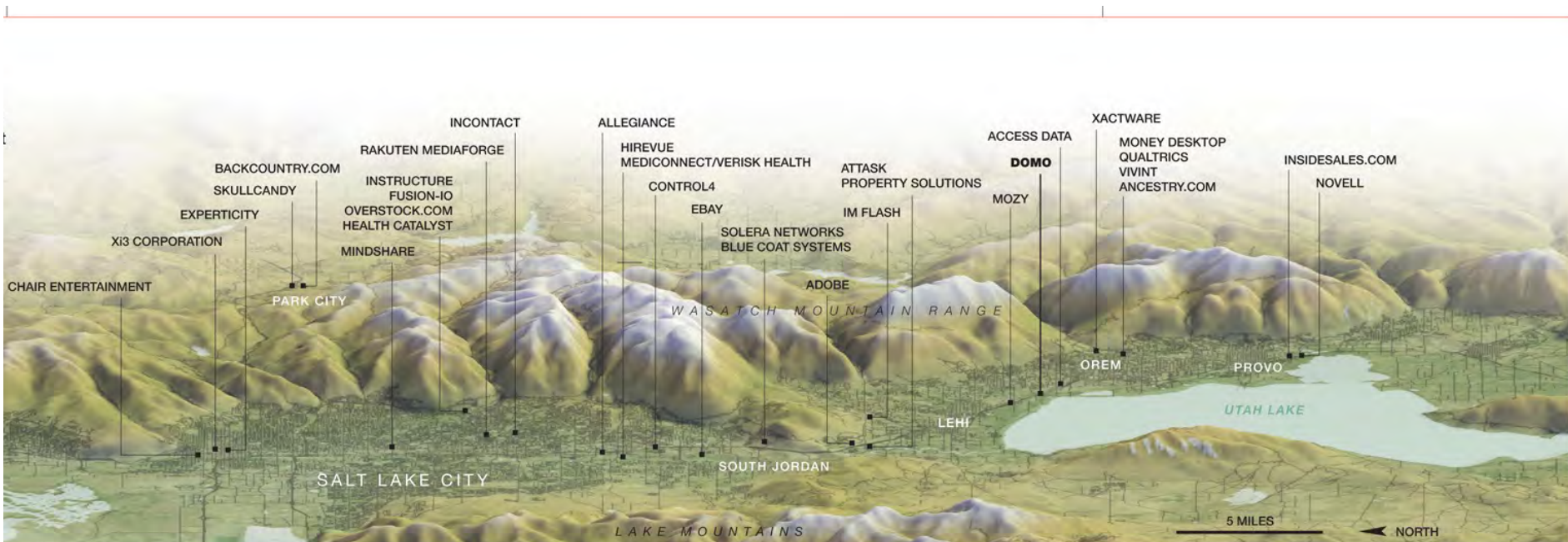
U of U





# ***Demand for Graduates - Silicon Slopes***

- 1,500 High Tech Companies to 8,147 currently
- Utah Unicorns since 2015  
Domo, Insidesales, Pluralsight  
Podium, Venafi, XANT.ai  
Divvy, Lucid, MX Technologies
- Qualtrics sold for \$8B in 2018





# *Engineering Admission*

- *Apply to U and indicate Engineering as your Major*
- *Receive Admission Letter from the U*
- *Receive Admission Letter from College of Engineering*
  - *Admitted as Engineering Student or Pre-Engineering Student*
  - *Three ways to qualify for direct admission*
    - *GPA of 3.6, ACT of 26, and ACT Math 28*
    - *GPA of 3.8, ACT of 27, and ACT Math 26*
    - *GPA of 3.8, Calculus A/B and Strong HS Science*
- *Accept Admission*
- *Pay Deposit*
- *Meet with Advisor in College*
- *Direct Admission or*
- *Admission to Department when Pre-requisites are met*
  - *Typically at end of Freshman Year*





# *Preparation for Engineering*

- *Math Readiness (students now choose math class)*
  - *Accuplacer CLM* 95
  - *ACT Math* 28
  - *SAT Math* 630
  - *AP Calculus A/B or B/C* 3
  - *Math 1050 and 1060*
- *Other Recommendations*
  - *Physics, Chemistry, Biology*
  - *AP English*
  - *AP Gen Ed*
  - *High School Engineering (if available)*



# ***Student Leave Policies***

- *Apply Sr. Year of High School*
  - *Admission*
  - *Scholarships*
- *Admitted with Deferred Start*
- *ACT, AP and IB Scores will not Expire*
- *Scholarships Held*
- *Easy Readmission*
- *Refresher Course for Math and Science*
- *Placement into Math not Compromised*
- *Engineering Math Sequence*



# *Funding your Studies*

- *Scholarships*
  - *University, State, Other*
  - *600+ Engineering Scholarships & Fellowships (\$2,600,000)*
- *Internships, Part-Time Work, Work-Study*
- *Federal and State Government Grants*
- *Student Loans*
- *Be a Full-Time Student*







# *Summary*

- *Great Opportunities in Engineering & Computer Science*
  - *Challenging Curriculum*
  - *Science and Math plus Creativity*
  - *Financial Rewards*
  - *Job Satisfaction*
  - *Opportunities in Good Financial Times and Bad*
  - *Engineers and Computer Scientists get Jobs!*
- *Help Solve the World's Grand Challenges*
  - *Energy, Environment, Communications,*
  - *Productivity, Healthcare*
- *Come to the U!*
  - *World-Class Faculty, Facilities, Equipment, & Reputation*