Learning AI

By John Benson

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1. Introduction

I've known for several years that the Artificial Intelligence Revolution started in my home area (the San Francisco Bay Area). But just for the heck of it, I looked at the "Top 10: AI Companies to Watch" from AI Magazine.[1] Here is the list, starting with number 1, along with the country and, for U.S. companies, their metropolitan region of origin:

1. OpenAI, San Francisco Bay Area (SF Bay Area), USA
2. DeepSeek, China
3. Microsoft, Redmond (Seattle Area), Washington, USA
4. Anthropic, SF Bay Area, USA
5. Alphabet, SF Bay Area, USA
6. Nvidia, SF Bay Area, USA
7. Meta, SF Bay Area, USA
8. IBM, New York City Area, USA
9. Baidu, China
10. Alibaba, China

And if the above list isn't enough to convince you, both IBM and Microsoft have major facilities in the SF Bay Area.[2] [3]

Of course, the SF Bay Area is in Northern California. California has some of the greatest advanced educational institutions in the world. In the SF Bay Area, we have Stanford and UC Berkeley, among several others. State-wide we have the California State University System with 23 Campuses throughout the state. Although I'm not going to list these, the following 10 campuses are in, or near the SF Bay Area:

1. CSU East Bay, Hayward, CA
2. Chico State, Chico, CA
3. Fresno State, Fresno, CA

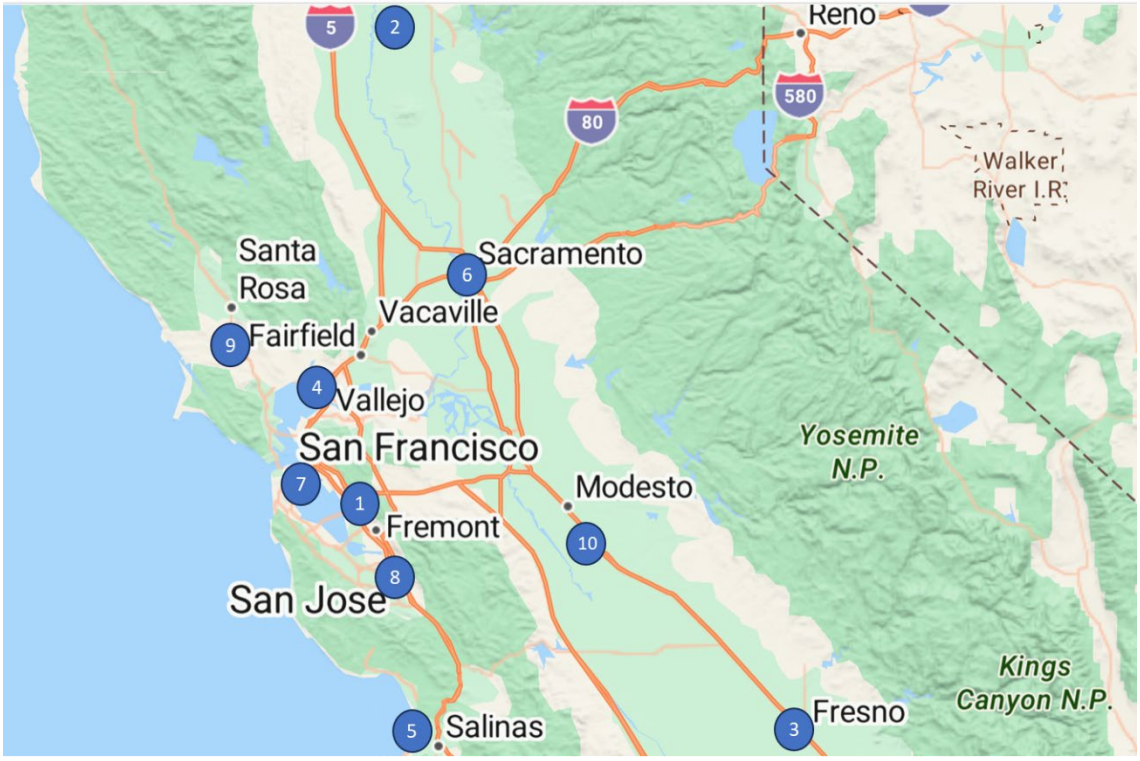
[1] Marcus Law, Technology Magazine, "Top 10: AI Companies to Watch," January 30, 2025, https://aimagazine.com/top10/top-10-ai-companies-to-watch

[2] Bay Area Staff, 'Microsoft's growing presence in the Bay Area" https://blogs.microsoft.com/bayarea/2020/01/21/california-bay-area-presence/

[3] Harry McCracken, Fast Company, "IBM Goes West: A 73-Year-Long Saga, From Punch Cards To Watson," 10-28-2016, https://www.fastcompany.com/3064902/ibm-goes-west-a-73-year-long-saga-from-punch-cards-to-watson

4. Cal Maritime, Vallejo, CA
5. CSU Monterey Bay, Seaside, CA
6. Sacramento State, Sacramento, CA
7. San Francisco State, San Francisco, CA
8. San José State, San José, CA
9. Sonoma State, Rohnert Park, CA
10. Stanislaus State, Turlock, CA

The map below of the SF Bay Area shows the location of each of these campuses.



As you might have gathered from the title of this post, The California State University System is going big on artificial intelligence (AI). See section 2 for more details.

2. CSU System

California State University on Tuesday (2/4) unveiled what is believed to be among the largest and most ambitious efforts in higher education to champion artificial intelligence with an initiative to provide tools and training in the groundbreaking technology across the system's 23 campuses.[4]

[4] Teresa Watanabe, Los Angeles Times via Yahoo, "CSU unveils massive venture to provide free AI tools and training across all 23 campuses" 2/4/25, https://www.yahoo.com/news/csu-unveils-massive-venture-free-183006417.html

With generative AI's ability to create new content learned from training data, CSU is working to ensure students in the nation's largest and most diverse public university system have equitable access to the technology. Nearly half of CSU's 450,000 students are low-income and about 30% are the first in their families to attend college.

The university has enlisted Gov. Gavin Newsom's office and nearly a dozen leading tech companies — including Microsoft, Meta, Nvidia, OpenAI, Intel, LinkedIn, Amazon Web Services and Alphabet — to join academics on an advisory board to help identify AI skills needed in the California workforce and provide advice on how best to teach them. Industry partners will also provide internships and apprenticeships to give students real-world experience with AI on the job.

“We are proud to announce this innovative, highly collaborative public-private initiative that will position the CSU as a global leader among higher education systems in the impactful, responsible and equitable adoption of artificial intelligence,” CSU Chancellor Mildred García said in a statement. “The comprehensive strategy will elevate our students’ educational experience across all fields of study, empower our faculty’s teaching and research, and help provide the highly educated workforce that will drive California’s future AI-driven economy.”

Industry leaders called the initiative a model for higher education during a news conference Tuesday at San Jose State University.

"The impact and the scale of what's happening here is really setting an inspirational example of what can happen when educational institutions, the government and industry partners come together and help students," said Brian Johnsrud, director of education, learning and advocacy at Adobe.

Ed Clark, CSU's chief, information office, said the effort started last year, after tech leaders told Newsom's office they could not find enough Californians or Americans overall equipped with the AI skills demanded by companies. Although 30 of the world's top 50 AI firms are based in California, they were hiring internationally for more than half of the related workforce, Clark said.

CSU leaders said they were also growing concerned by a new "digital divide" among its campuses, with some racing forward to offer AI tools and training to students and others without the resources to do so.

"We cannot afford to leave some of our institutions behind during this time of dramatic change," Nathan Evans, deputy vice chancellor for academic and student affairs, told the Board of Trustees during a briefing on the initiative last week.

Cal State Channel Islands, one of the system's smaller campuses with about 5,000 students, could not afford the $500,000 annual price tag for campuswide access to AI tools, said Jill Leafstedt, dean for extended university and digital learning. Some faculty were using it to enrich their teaching, including an environmental sciences professor who developed a bot named Marlowe that uses humor and a pirate's voice to help students learn to write scientifically. But others "barely dabbled" in the technology, she said.

The new CSU initiative will even the playing field for all, she said.

"The smaller campuses don't have the buying power and resources for this, so this is really a matter of equity and getting this in the hands of all students regardless of the campus they go to," she said.

CSU has developed a systemwide "AI Commons Hub" that provides free access to such tools as ChatGPT 4.0, a chatbot that can answer questions, assist with writing, help brainstorm, provide coding help and perform other tasks using human-like conversations. The university licensed the technology, customized for education, from OpenAI for all CSU students, faculty and staff — more than 500,000 users that marks the largest deployment of ChatGPT in the world, said Leah Belsky, the firm's general manager of education.

Trainings include lessons on how to construct an effective prompt and ethical use of the technology. Other resources are offered by partners, including Microsoft's Copilot, which can help summarize information and automate tasks such as writing emails, creating presentations and analyzing spreadsheets in Word, Excel, PowerPoint and other company products.

The hub will provide professional development for faculty, including training on how to create lesson plans that both encourage the use of the technology in safe and responsible ways and "AI-proof" assignments so students don't simply turn to ChatGPT do all of the work. Some faculty have reported widespread cheating that they tie to AI.

Others are concerned about bias — one study found, for instance, that when AI screened job applications, it disproportionately rejected women because the dataset used to train it included more men as successful employees.

But in a resolution last year, the Academic Senate commended Garcia's office for providing funding and professional development to explore AI skills for teaching and learning and encouraged more of it.

"AI can be used for good and bad," Clark said, adding that the advisory board will help address faculty and community concerns about bias, academic integrity, intellectual property and privacy.

Clark said he encourages students to use AI in his courses at Cal State Fullerton but requires that they note how they used it in their assignments. "They can't take responsibility for something that was generated by an AI," he said. "We're not going to tolerate academic dishonesty."

But AI can help students learn, spark creativity and gain confidence, educators say. In his information systems course at Fullerton, Clark said, many students who used AI to create a business plan for a coffee shop produced stellar projects — all of them different, demonstrating independent thinking. AI might have spurred ideas on creative designs, for instance, or "talked" through flaws of the proposed plan, but the oral presentations required students to demonstrate their mastery of concepts learned in class. It's a very interactive tool that serves, in many ways, as a tutor along with the class materials."

He said resistance toward AI today is similar to bans against using calculators during exams years ago because educators believed students should know how to do the math manually. Today, calculators are allowed even during SAT math tests — and AI skills should be widely embraced in part because employers are demanding them, CSU officials say.

According to LinkedIn, a platform that provides employment forecasts, along with professional networking and career development, hiring for AI jobs has grown 30% faster than overall hiring in the last year and 300% over the last eight years.

CSU, which graduates 125,000 students each year, with alumni accounting for 10% of the California workforce, is determined to prepare them for the new job opportunities.

"Right now, AI is transforming every field, from academia to the workforce," Clark said. "We will ensure that our students graduate with the knowledge of how to use AI."

3. AI Definitions

Artificial Intelligence (AI): *the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. Since their development in the 1940s, digital computers have been programmed to carry out very complex tasks—such as discovering proofs for mathematical theorems or playing chess—with great proficiency. Despite continuing advances in computer processing speed and memory capacity, there are as yet no programs that can match full human flexibility over wider domains or in tasks requiring much everyday knowledge. On the other hand, some programs have attained the performance levels of human experts and professionals in executing certain specific tasks, so that artificial intelligence in this limited sense is found in applications as diverse as medical diagnosis, computer search engines, voice or handwriting recognition, and chatbots.*[5]

AI Governance: *Artificial intelligence (AI) governance refers to the processes, standards and guardrails that help ensure AI systems and tools are safe and ethical. AI governance frameworks direct AI research, development and application to help ensure safety, fairness and respect for human rights.*[6]

Effective AI governance includes oversight mechanisms that address risks such as bias, privacy infringement and misuse while fostering innovation and building trust. An ethical AI-centered approach to AI governance requires the involvement of a wide range of stakeholders, including AI developers, users, policymakers and ethicists, ensuring that AI-related systems are developed and used to align with society's values.

AI governance addresses the inherent flaws arising from the human element in AI creation and maintenance. Because AI is a product of highly engineered code and machine learning (ML) created by people, it is susceptible to human biases and errors that can result in discrimination and other harm to individuals.

Governance provides a structured approach to mitigate these potential risks. Such an approach can include sound AI policy, regulation and data governance, help ensure that machine learning algorithms are monitored, evaluated and updated to prevent flawed or harmful decisions, and that data sets are well trained and maintained.

AI governance is essential for reaching a state of compliance, trust and efficiency in developing and applying AI technologies. With AI's increasing integration into organizational and governmental operations, its potential for negative impact has become more visible…

[5] https://www.britannica.com/technology/artificial-intelligence

[6] Cole Stryker, IBM, "What is AI governance?" October 10, 2024, https://www.ibm.com/think/topics/ai-governance

Generative AI: *is a subset of artificial intelligence that uses generative models to produce text, images, videos, or other forms of data. These models learn the underlying patterns and structures of their training data and use them to produce new data based on the input, which often comes in the form of natural language prompts.*[7]

Improvements in transformer-based deep neural networks, particularly large language models (LLMs), enabled an AI boom of generative AI systems in the early 2020s. These include chatbots such as ChatGPT, Copilot, Gemini, and LLaMA; text-to-image artificial intelligence image generation systems such as Stable Diffusion, Midjourney, and DALL-E; and text-to-video AI generators such as Sora. Companies such as OpenAI, Anthropic, Microsoft, Google, and Baidu as well as numerous smaller firms have developed generative AI models.

Generative AI has uses across a wide range of industries, including software development, healthcare, finance, entertainment, customer service, sales and marketing, art, writing, fashion, and product design. However, concerns have been raised about the potential misuse of generative AI such as cybercrime, the use of fake news or deepfakes to deceive or manipulate people, and the mass replacement of human jobs. Intellectual property law concerns also exist around generative models that are trained on and emulate copyrighted works of art and literature.

[7] Wikipedia article on Generative Artificial Intelligence. Note that secondary references have been deleted from the above text. https://en.wikipedia.org/wiki/Generative_artificial_intelligence