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From China to San Francisco: The Location of Investors in Top U.S. AI Startups

CSET Data Brief

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Executive Summary

U.S. artificial intelligence startups are raising billions of dollars from private investors both domestic and abroad. Chinese investors in U.S. startups have attracted particular scrutiny due to concerns related to technology transfer, and yet there is little systematic analysis of foreign investment in U.S. AI startups, or the location of investors into U.S. AI startups more broadly. By analyzing thousands of U.S.-based startups and their investors, we find:

- China is the top location for foreign investors into top U.S. AI startups, with 5 percent of total investors. Foreign investors as a whole make up 24 percent of the investors into top U.S. AI startups.
- Chinese investors are more likely to invest in U.S. AI startups than in other industries. Top U.S. AI startups are likely to have a greater number of Chinese investors than startups in other industries.
- 20 percent of top U.S. AI startups have at least one Chinese investor, despite the fact that Chinese investors only make up 5 percent of investors into top U.S. AI startups.
- About $3B (15 percent) of the $21B raised by top U.S. AI startups was raised in rounds involving at least one Chinese investor.
- Domestically, the San Francisco Bay Area is central to the AI startup scene—49 percent of U.S. investors in top U.S. AI startups are located there, and 95 percent of top U.S. AI startups have at least one investor from the Bay Area.

Investor Location Context

Because the private sector dominates the U.S. AI ecosystem, foreign and domestic private investors have influence over technology critical to U.S. national security. Many investors in U.S. AI startups simply aim to make money, and analyzing the patterns of investment within the United States and abroad reveals the geographic hubs essential to the funding of U.S. AI startups.

In addition, investors can sometimes use their position to acquire access to private technical information, or gain a controlling interest in the company. The Chinese government in particular has a well-documented history of both legal, illegal, and extralegal mechanisms of technology transfer to support the country's development of AI, including an explicit strategy of investing in foreign AI companies.[1]

The United States currently takes limited actions to restrict foreign investors in sensitive technologies. The Committee on Foreign Investment in the United States (CFIUS) was originally given the power to review foreign acquisitions; in 2018 its purview was expanded to also include foreign noncontrolling equity investments. However, this power is rarely used.[2] A report from the National Security Commission on AI recommended mandated CFIUS filings for all Chinese and Russian investments into AI companies, arguing that this broader application of CFIUS is "necessary to mitigate threats from adversarial capital" to early-stage AI startups.[3]

While interest in specific countries' tech transfer and acquisition of AI startups is high, there has been limited analysis of the location of private investment into AI startups more broadly. By analyzing the location of investors into AI startups, we can identify geographic areas that the U.S. AI ecosystem relies on, and assess the scope and nature of possible foreign influence over the U.S. AI ecosystem through the venture capital market.

Findings

Foreign Investors in Top AI Startups

Our analysis focuses on 177 top U.S. AI startups, as identified by *Forbes* and the CB Insights data service in analyses from 2019 and 2020. We also defined two comparison groups: a group of 151 leading U.S. startups in industries other than AI ("top U.S. non-AI startups"), and a group consisting of *all* 3,029 U.S. startups we identified as active in AI ("all U.S. AI startups"). The appendix explains how we compiled each group.

According to Crunchbase data, the 177 companies in our "top U.S. AI startups" sample have 1,191 total investors. As shown in Table 1, 24 percent of these investors are foreign—higher than the rate for top non-AI startups, at 18 percent, but less than the rate of foreign investors for all AI startups, at 31 percent.

The most frequent location for foreign investors into top U.S. AI startups is China,[*] at 5 percent of the investors, followed by Japan and the United Kingdom—each at around half that. The percent of Chinese investors in top U.S. AI startups is more than double the rate for top non-AI startups (2 percent).

[*]We defined Chinese investors as all investors based in China or Hong Kong.

Table 1: Most Investors in U.S. AI Startups Are Located in the United States, Followed by China[4]

Investor Country	Prevalence Among Investors in Top U.S. AI Startups[5]	Prevalence Among Investors in Top U.S. Non-AI Startups	Prevalence Among Investors in All U.S. AI Startups
United States	76%	82%	69%
China	5%	2%	4%
Japan	2%	1%	2%
United Kingdom	2%	3%	4%
Singapore	1%	1%	1%
Other	12%	11%	20%
Total Non-U.S.	24%	18%	31%

Source: CSET analysis of Crunchbase data, for investors with known location. Countries are ordered by prevalence among investors in top U.S. AI startups. The number of investors is 919 in top U.S. AI Startups, 876 in top U.S. non-AI startups, and 4,208 in all U.S. AI startups. Read as: "76 percent of investors in top U.S. AI startups are located in the United States, as compared to 82 percent of investors in top U.S. non-AI startups and 69 percent of investors in all U.S. AI startups."

While investors located in China only comprise 5 percent of the group of investors, their reach is significant: 20 percent of top U.S. AI startups have one or more Chinese investors. For top U.S. non-AI startups, the rate of investors from China drops to 13 percent.[6] This difference indicates disproportionate Chinese interest in AI startups relative to other top startups. Japan and the United States also displayed an increase in the number of investors for AI startups compared to non-AI startups; the United Kingdom and Singapore did not. It is unclear whether the prevalence of Chinese investors in top U.S. AI startups was motivated primarily by financial returns, by strategic interest in the technology, or a combination of the two.[7]

Table 2: Almost All Top U.S. AI Startups Have an Investor from the United States, Followed by China and the United Kingdom[8]

Investor Country	Percent of Top U.S. AI Startups with At Least One Investor from This Country[9]	Percent of Top U.S. Non-AI Startups with At Least One Investor from This Country	Percent of All U.S. AI Startups with At Least One Investor from This Country
United States	100%	99%	87%
China	20%	13%	7%
United Kingdom	17%	22%	7%
Japan	11%	5%	4%
Singapore	7%	5%	3%

Source: CSET analysis of Crunchbase data. Countries are ordered by prevalence of top U.S. AI startups with an investor from that location. There are 177 startups in top U.S. AI startups, 151 in top U.S. non-AI startups, and 3,029 in all U.S. AI startups. Read as: "100 percent of top U.S. AI startups have an investor from the United States; 99 percent of top U.S. non-AI startups have an investor from the United States, 87 percent of all U.S. AI startups have an investor from the United States."

The impact of Chinese investors on top U.S. AI startups can also be seen in funding. Eight percent of all funding rounds—15 percent of value—involved Chinese investors, as shown in Table 3. This is significantly higher than the percent of funding rounds involving Chinese investors for U.S. non-AI startups, around 6 percent, or all U.S. AI startups, at 5 percent. Funding rounds for top U.S. AI startups are more likely to have a Chinese investor than for all AI startups.[10] The same was not true for top non-AI startups.

Table 3: 15 Percent of Top U.S. AI Startup Funding Is Raised in Rounds with Chinese Investors, 8 Percent of Rounds Involve Chinese Investors[11]

	Total Raised	Total Raised in Rounds with Chinese Investors	Percent Raised in Chinese Rounds	Total Number of Rounds	Total Number of Rounds with Chinese Investors	Percent of Rounds Involving Chinese Investors
Top U.S. AI Startups	$21B	$3B	15%	679	58	8%
Top U.S. Non-AI Startups	$31B	$5B	15%	671	41	6%
All U.S. AI Startups	$55B	$7B	12%	6,627	328	5%

Source: CSET analysis of Crunchbase data. Read as: "Out of 21 billion raised in funding rounds by top U.S. AI startups, 3 billion (15 percent) was raised in rounds with a Chinese investor. Of 679 rounds raised by top U.S. AI startups in total, 58 (8 percent) included a Chinese investor."

No single Chinese investor stands out as significantly more active than the others; instead, 50 investors each fund a small number of the top U.S. AI startups. The most active investor from China is Baidu, one of China's largest AI companies; Tencent and Alibaba both also appear in the list of active Chinese investors. Interestingly, we found no evidence that the most active Chinese investors were more likely to invest in AI startups than non-AI startups, however several top Chinese investors were more likely to invest in *top AI* startups than top non-AI startups or all AI startups, suggesting they are specifically prioritizing more successful AI startups.

Table 4: No Chinese Investor Invests in More Than Four Top U.S. AI Startups[12]

Investor	Number of Top U.S. AI Startups Invested In	Number of Top U.S. Non-AI Startups Invested In	Number of All U.S. AI Startups Invested In
Baidu Ventures	4	1	11
Tencent Holdings	4	0	0
Horizons Ventures	3	1	12
IDG Capital	3	1	6
Sequoia Capital China	3	0	0
ZhenFund	3	1	22
Northern Light Venture Capital	2	0	0
FREES FUND	2	0	0
Ironfire Ventures	2	1	3
CreditEase Fintech Investment Fund	2	2	3

Source: CSET analysis of Crunchbase data. Investors are ordered by the number of top U.S. AI startups invested in; only the top 10 are included. Read as: "Baidu invests in four of the top U.S. AI startups, one of the top U.S. non-AI startup, and 11 of all U.S. AI startups."

Similarly, although 20 percent of top U.S. AI startups have one or more Chinese investors, few have a significant number of Chinese investors. Three top U.S. AI startups have three or more Chinese investors, as shown in Table 5: Pony.ai, TuSimple, and Kneron. The strong Chinese interest makes sense given the companies' origins: Pony.ai was co-launched in China and California, while TuSimple and Kneron split their operations between China

and the United States. Five of the top U.S. AI startups (3 percent) have 50 percent or more Chinese investors: Pony.ai, TuSimple, Kneron, DataVisor, and Nuro.

Table 5: Pony.ai, TuSimple, and Kneron Are Top U.S. AI Startups by Number of Chinese Investors

Organization	Number of Chinese Investors	Total Number of Investors	Percentage of Chinese Investors
Pony.ai	13	22	59%
TuSimple	10	15	67%
Kneron	5	8	62%
Arraiy	2	8	25%
Arterys	2	17	12%
Atomwise	2	16	12%
DataVisor	2	4	50%
H2O.ai	2	19	10%
Nuro	2	4	50%
Subtle Medical	2	9	22%
Unity Technologies	2	13	15%
AMP Robotics	1	6	17%
Affectiva	1	13	8%
Anyscale	1	7	14%

Bossa Nova Robotics	1	8	12%
Butterfly Network	1	5	20%
Citrine Informatics	1	11	9%
Covariant	1	8	12%
DefinedCrowd	1	14	7%
Drive.ai	1	8	12%

Source: CSET analysis of Crunchbase data. Startups are ordered by the number of Chinese investors; only top 20 are included. Read as: "Pony.ai has 13 Chinese investors out of a total of 22 investors (59 percent)."

Domestic Investors in Top AI Startups

As shown in Table 6, 49 percent of U.S.-based investors into the top U.S. AI startups are located in the San Francisco Bay Area.[13] For top U.S. non-AI startups, however, only 40 percent of investors were located there, suggesting the Bay Area is a particular hub for AI investors. The second most common location is the New York area, with 18 percent of U.S. investors. However, there the pattern was reversed: 23 percent of top U.S. non-AI startups had investors from New York, suggesting relatively fewer AI-focused investors in New York.

Table 6: San Francisco Bay Area Has Greatest Percent of Investors in Top U.S. AI Startups, Followed by New York and Boston[14]

Hubs	Percent of U.S. Investors in Top U.S. AI Startups	Percent of U.S. Investors in Top U.S. Non-AI Startups	Percent of U.S. Investors in All U.S. AI Startups
San Francisco Bay Area	49%	40%	31%
New York Area	18%	23%	18%
Boston Area	6%	6%	5%
Los Angeles Area	4%	7%	5%
Washington-Baltimore Area	3%	3%	2%
Seattle Area	2%	2%	2%
San Diego Area	1%	1%	1%

Source: CSET analysis of Crunchbase data. Hubs are those identified in the research by Flagg and Olander, and are ordered by the percent of U.S. investors in top U.S. AI startups. The number of U.S. investors is 699 in top U.S. AI startups, 718 in top U.S. non-AI startups, and 2,901 in all U.S. AI startups. Read as: "49 percent of U.S. investors in top U.S. AI startups are located in the San Francisco Bay Area, as compared to 40 percent of investors in top U.S. non-AI startups and 31 percent of investors in all U.S. AI startups.

Investors in the San Francisco Bay Area also have significant reach: 95 percent of top U.S. AI startups have one or more investors from the Bay Area, as shown in Table 7. 53 percent have one or more investors in the New York area, and 27 percent have one or more investors in the Boston area.

Table 7: The Vast Majority of Top U.S. AI Startups Have an Investor from the San Francisco Bay Area, Followed by New York and Boston[15]

Hubs	Percent of Top U.S. AI Startups with an Investor from Hub	Percent of Top U.S. Non-AI Startups with an Investor from Hub	Percent of All U.S. AI Startups with an Investor from Hub
San Francisco Bay Area	95%	84%	58%
New York Area	53%	68%	28%
Boston Area	27%	30%	12%
Los Angeles Area	17%	33%	8%
Washington-Baltimore Area	15%	13%	5%
Seattle Area	12%	9%	4%
San Diego Area	5%	5%	2%

Source: CSET analysis of Crunchbase data. Table includes startups with at least one U.S.-based investor. Hubs are those identified in the research by Flagg and Olander, and are ordered by the percent of top U.S. AI startups with one or more investors from that location. There are 177 startups in top U.S. AI startups, 151 in top U.S. non-AI startups, and 3,029 in all U.S. AI startups. Read as: "95 percent of top U.S. AI startups have one or more investors from the San Francisco Bay Area, as compared to 84 percent of top U.S. non-AI startups and 58 percent of all U.S. AI startups."

The findings add nuance to the traditional view of which U.S. cities lead in AI. While the San Francisco Bay Area dominates the funding scene, New York investors also play a sizable role, albeit one slightly smaller than expected for a city of its size—New York investors are less likely to invest in AI startups than non-AI startups.[16] On the other hand, Boston is third place in terms of the percentage of U.S. investors and disproportionately interested in AI startups.

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Appendix: Methodology

- **Identifying Top U.S. AI Startups:** We combined CB Insights' Top 100 AI Startups of 2019, CB Insights' Top 100 AI Startups of 2020, Forbes' America's Most Promising AI Companies of 2019 and Forbes' America's Most Promising AI Companies of 2020. For Forbes, an AI startup needed to show that techniques such as machine learning, natural language processing, or computer vision were core to the business model. For CB Insights, a startup's AI focus was evaluated on factors including patent activity and tech novelty. We restricted our analysis to companies listed on Crunchbase, headquartered in the United States, not publicly traded, with a Crunchbase-reported employee count of 5 thousand and under. This resulted in a list of 177 top U.S. AI startups.
- **Identifying Top U.S. Non-AI Startups:** We combined LinkedIn's 50 Hottest U.S. Companies of 2019, Forbes' America's Best Startup Employers of 2020, and AngelList's 52 Best Startup Companies To Watch Out for in 2020. We restricted our analysis to companies listed on Crunchbase, headquartered in the United States, not publicly traded, with a Crunchbase-reported employee count of 5 thousand and under. This resulted in a list of 151 top U.S. non-AI startups.
- **Identifying All U.S. AI Startups:** We identified all organizations in Crunchbase with the category group tag "Artificial Intelligence." We restricted our analysis to companies listed on Crunchbase, headquartered in the United States, not publicly traded, with a Crunchbase-reported employee count of 5 thousand and under. This resulted in a list of 3,029 U.S. AI startups.
- **Identifying Investors:** Data was extracted from Crunchbase on September 16, 2020. To identify the relevant investors into companies, we matched startups to investors and funding rounds through the company's Crunchbase universally unique identifier (UUID). We restricted relevant investments to Angel, Convertible Note, Corporate Round, Pre-Seed, Private Equity, Seed, Series A, Series B, Series C, Series D, Series E, Series F, Series G, Series H, Series I, Series J, and Series Unknown. We excluded rounds labeled as Debt Financing, Equity Crowdfunding, Grant, Initial Coin Offering, Non-Equity Assistance, Post IPO Debt, Post IPO Equity, Post IPO Secondary, Product Crowdfunding, Secondary Market, and Undisclosed. Investments date back to 1998, however the vast majority of investments (more than 97 percent) date from 2010 or later, and the majority date from 2017 or later.

- **Significance Testing:** We performed two different types of significance tests. If we considered dependent variables with only two possible outcomes, we used logistic regression. If the dependent variable was a count, we used Poisson regression. To control for the false discovery rate, all test results with the same or closely related dependent variables were adjusted using the Benjamini-Hochberg procedure. Statistical significance testing's accuracy relies on the representativeness of the groups evaluated. We attempted to draw a diverse group of top AI and top non-AI startups from several highly-regarded lists of startups to avoid the biases of any particular list, but cannot be confident that these lists accurately reflect the groups they are intended to represent.

Endnotes

[1] William Hannas and Huey-Meei Chang, "China's Access to Foreign AI Technology: An Assessment" (Center for Security and Emerging Technology, September 2019), https://cset.georgetown.edu/research/chinas-access-to-foreign-ai-technology/; Michael Brown and Pavneet Singh, "China's Technology Transfer Strategy: How Chinese Investments in Emerging Technology Enable a Strategic Competitor to Access the Crown Jewels of U.S. Innovation" (Defense Innovation Unit Experimental, January 2018), https://admin.govexec.com/media/diux_chinatechnologytransferstudy_jan_2018_(1).pdf.

[2] CFIUS has been used to block only five investments in the past 30 years, although some investments may have been withdrawn before anticipated blocks from CFIUS. See James K. Jackson, "The Committee on Foreign Investment in the United States (CFIUS)," Congressional Research Service, February 14, 2020, https://fas.org/sgp/crs/natsec/RL33388.pdf

[3] *Quarter 2 Recommendations* (Washington, DC: National Security Commission on Artificial Intelligence), https://drive.google.com/file/d/1hgiA38FcyFcVQOJhsycz0Ami4Q6VLVEU/view

[4] Significance testing found that investors into top U.S. AI startups are more likely to be from the United States and China than investors into just top or just AI startups. Investors into top U.S. AI startups are no more likely to be from the United Kingdom, Japan, or Singapore than investors into just top or just AI startups. For significance testing, startups in all U.S. AI startups but not in top U.S. AI startups were defined as non-top startups.

[5] Of investors with location in Crunchbase.

[6] This finding is statistically significant. All findings of statistical significance are at the p <= 0.05 level unless otherwise specified.

[7] Other sources have found evidence of foreign investors being motivated by both strategic and financial purposes. For example, CSET analysis finds that Chinese investment does not seem disproportionately strategic (Zachary Arnold, Ilya Rahkovsky, and Tina Huang, "Tracking AI Investment: Initial Findings from the Private Markets" Center for Security and Emerging Technology, September 2020), https://cset.georgetown.edu/wp-content/uploads/CSET-Tracking-AI-Investment.pdf), while other CSET research makes it clear that technology transfer is one explicit goal of Chinese investment in U.S. AI companies (Hannas and Chang, "China's Access to Foreign AI"). One avenue of further research that could shed light on this question is an exploration of which corporate foreign investors have state backing or military contracts. Further analysis could also focus on the difference in deal phases prioritized between foreign and domestic investors. This analysis could shed insight into whether investors aimed to learn about new technologies, by investing in early-stage companies, or were aiming for financial returns from later-stage companies. We leave that for future analysis.

[8] For China and Japan, significance testing found that being a "top" tier startup and the focus on AI were both factors in the number of investors from that location; only the "top" nature of

a startup was a factor in whether or not the startup had an investor from that location. Being a top startup and the focus on AI were both factors in the number of investors from the United States; neither were factors in whether or not the startup had an investor from the United States. For the United Kingdom and Singapore, significance testing found whether a startup is a "top" was a factor in whether or not the startup had an investor from that location as well as how many investors were from that location; the focus on AI was not a factor for either.

[9] Of investors with location in Crunchbase.

[10] This finding is statistically significant.

[11] Significance testing found that funding rounds for top AI startups were more likely to have a Chinese investor than funding rounds for non-top AI startups, and were no more likely to have a Chinese investor than funding rounds for non-AI top startups.

[12] Baidu, IDG Capital and Horizons are more likely to invest in a top startup than a non-top startup, and a top AI startup than other startups, but are no more likely to invest in an AI startup than a non-AI startup. Tencent and Alibaba are more likely to invest in a top AI startup than other startups, but are not more likely to invest in a top startup than a non-top startup, or an AI startup than a non-AI startup. ZhenFund is no more likely to invest in a top startup than a non-top startup, an AI startup than a non-AI startup, or a top AI startup than other startups.

[13] This finding is statistically significant. Our geographic analysis uses the "hubs" described in Melissa Flagg and Justin Olander, "AI Hubs in the United States" (Center for Security and Emerging Technology, May 2020), https://cset.georgetown.edu/research/ai-hubs-in-the-united-states/. The hubs are: Boston-Worcester-Manchester, MA-NH area (Boston); Los Angeles-Long Beach-Riverside, CA area (Los Angeles); New York-Newark-Bridgeport, NY-NJ-CT-PA area (New York); San Diego-Carlsbad-San Marcos, CA (San Diego); San Jose-San Francisco-Oakland, CA area (San Francisco); Seattle-Tacoma-Olympia, WA area (Seattle); Washington-Baltimore-Northern Virginia, DC-MD-VA-WV area (Washington-Baltimore).

[14] Significance testing found that investors into top U.S. AI startups are more likely to be from the San Francisco Bay Area and the Boston area than investors into just top or just AI startups. Investors into top U.S. AI startups are more likely to be from the Los Angeles or New York area than investors into just AI startups; the same is not true for just top startups. Investors into top U.S. AI startups are no more likely to be from the San Diego, Washington-Baltimore or Seattle areas than investors into just top or just AI startups.

[15] For the San Francisco Bay Area, significance testing found that whether a startup is in the "top" tier and the focus on AI were both factors in whether or not the startup had an investor from that location; only the "top" nature of a startup was a factor in the number of investors from that location. For the Boston, Seattle, San Diego, and Washington-Baltimore areas, significance testing found that whether a startup was in the "top" tier was a factor in whether or not the startup had an investor from that location as well as the number of investors from that location; the focus on AI was not a factor for either. For the New York and Los Angeles areas, both the "top" tier nature of a startup and the focus on AI were factors in whether or

not the startup had an investor from that location and how many investors are from that location. However, the significance testing does not convey the direction of the effect; the data suggests that while top startups were more likely to have investors and a greater number of investors from New York and Los Angeles, AI startups were *less* likely to have investors, and were likely to have a fewer number of investors from those areas.

[16] This finding is statistically significant.