

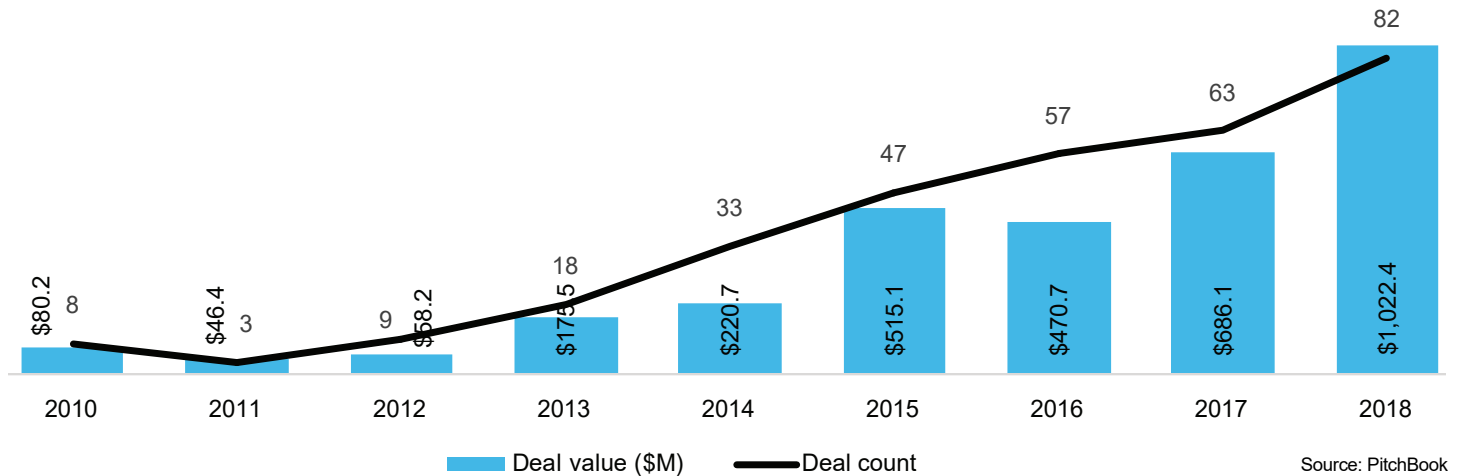
 **Technologies CAPITAL**

Venture Investment at the Nexus of Cybersecurity and AI/ML

Data provided by  PitchBook.

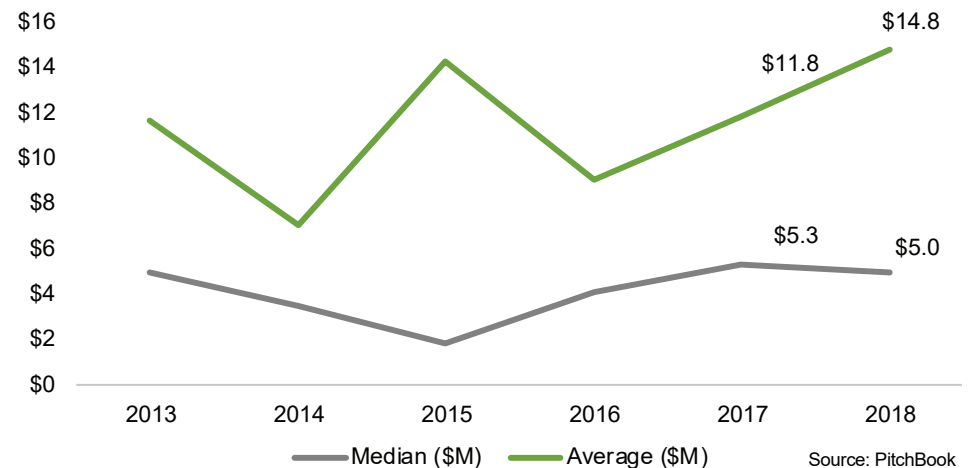
AI/ML powering deals in cybersecurity

Global VC deal activity at the nexus of cybersecurity and AI/ML, 2010-2018



Venture capital investment at the nexus of cybersecurity, artificial intelligence and machine learning (AI/ML) has never been more robust, with firms cutting **larger checks to a smaller set of mature companies using intelligent threat detection tools enabled by automation and deep learning.** These developments in AI/ML have improved visibility into network vulnerabilities and user behaviors for the enterprise. As VC investment increases across this space, some startups have consolidated the number of services they offer to analyze and monitor the growing array of applications and devices deployed on premise and in the cloud.

Global average and median VC deal size at the nexus of cybersecurity and AI/ML, 2013-2018



Meanwhile, several successful exits in recent years, including **Okta's IPO, have demonstrated to investors that next-gen cybersecurity companies can also become strong performers in the public markets,** further bolstering investor sentiment. Likewise, Cylance's sale to BlackBerry and Redlock's purchase by Palo Alto Networks have illustrated that **startups deploying AI/ML for cyber threat detection and protection are starting to identify and target problems with solutions that some incumbents have failed to adequately address.**

Since the end of 2008, aggregate VC investment expanded on a compound annual basis of 63.1%; over the same period, the volume of financing rounds registered a CAGR of 39.2%. The **global growth of overall venture investment activity has largely tracked the trajectory of dealmaking in the US.** Last year, US-based companies in this space commanded 44 of the 82 funding rounds closed and attracted some 75% of the roughly \$1 billion invested in total. Persistent investor interest has pushed the



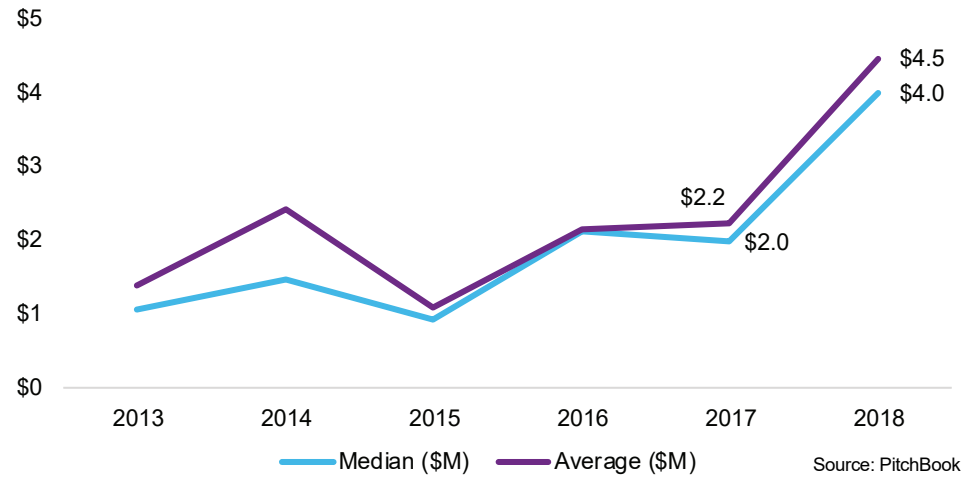
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Malicious bot activity now comprises a third of all internet traffic

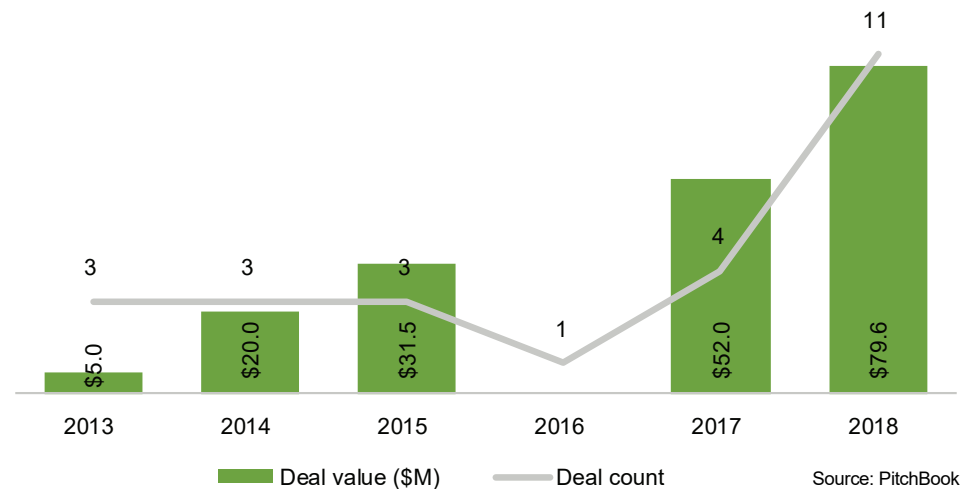
average round size up from just \$7.1 million as recently as 2014 to \$14.8 million last year globally. With many of the most well-funded companies staying private longer, often beyond five funding rounds, the median deal size at the later stage has also climbed steadily from \$7.1 million in 2014 to \$30 million last year. **Between 2017 and 2018, both the average and median angel/seed round sizes doubled.** Meanwhile, easier access to capital combined with the pace of innovation being driven by today's threat environment has helped mature startups secure just over half of the \$1.7 billion in total funding raised in this space over the last two years alone.

With prices on the up, **an increasing number of investors have turned to Israel for new opportunities** at the nexus of cybersecurity and AI/ML. Since recording \$5 million in combined venture investment for 2013, aggregate deal value climbed at a staggering 74% CAGR to some \$80 million last year. As a result of this rapid growth, the Israeli ecosystem has quickly matured to produce a handful of emerging cybersecurity leaders employing AI/ML tools to automate threat detection for the enterprise cloud and the Industrial IoT. Overall, Israeli companies in this space have raised \$188.1 million from VCs across 25 deals between 2013 and the end of 2018.

Global average and median angel/seed VC deal size at the nexus of cybersecurity and AI/ML, 2013-2018



Israel VC deal activity at the nexus of cybersecurity and AI/ML



Unicorns operating at the nexus of cybersecurity and AI/ML



VC raised: \$481.2M
Rounds: 6
Founded: 2011



VC raised: \$327M
Rounds: 5
Founded: 2012



VC raised: \$234.2M
Rounds: 6
Founded: 2013

Rising stars in developing intelligent threat detection



VC raised: \$46.1M
Rounds: 3
Founded: 2016



VC raised: \$39.3M
Rounds: 3
Founded: 2016



VC raised: \$32.2M
Rounds: 3
Founded: 2014

Q&A: Dell Technologies Capital President Scott Darling



Scott Darling is the President of Dell Technologies Capital (DTC), the venture capital arm of Dell Technologies that he founded in 2012. Scott leads the investment team and represents DTC on the boards of Zscaler (ZS), Noodle.ai and Barefoot Networks. He previously served on the board of DocuSign (DOCU) for 11 years. DTC has averaged \$100 million in new investments annually for the last seven years.

In addition to his investment responsibilities, Scott leads corporate development activities for Dell Technologies in support of Dell, Dell EMC, Pivotal, RSA, SecureWorks, Virtustream and VMware. Before joining Dell Technologies, Scott was President of EMC Ventures and Corporate Development. Prior to EMC, Scott was a General Partner at Frazier Technology Ventures. Scott joined Intel Capital in 2000, where he was Vice President and Managing Director; during his tenure, Scott managed the investment teams in support of business units accounting for more than two-thirds of Intel's revenue.

Scott received his MBA from Stanford University's Graduate School of Business in 1988. He is based in Palo Alto, CA.

What is the state of Dell Technologies Capital now that you are two years out of stealth?

I founded the venture practice in 2012 and operated it in stealth until early 2017. Since then, we've been fortunate to see several category-defining investments exit our portfolio, including the IPOs of Zscaler, DocuSign and MongoDB along with the sales of Cylance, RedLock, CloudEndure, WaveFront to strategic acquirers. In the seven years since inception, we have witnessed five IPOs and nearly 40 acquisitions out of approximately 100 investments. We continue to invest actively at least \$100 million in new capital every year.

That is an impressive list of exits. Are you willing to share any performance numbers and industry trends driving these performance numbers?

Based on PitchBook data, both DPI and TVPI returns for five out of our last six annual funds exceed the performance threshold for top decile VC funds of similar vintages, in most years by a factor of 2x! It is a great time to be an investor because many fundamental technology shifts are having an impact across virtually every sector in the

economy. To name just a couple, primary technology trends of interest to us are a) cloud computing, b) AI/ML and c) new silicon technologies.

How is the investment landscape in cybersecurity changing? How are trends in cloud computing and AI/ML informing your thesis?

Cybersecurity is constantly in a state of innovation and has been a big beneficiary of cloud computing trends. We were fortunate to lead the Series A investments in Zscaler and RedLock. Much like how cloud has disrupted numerous sectors in cybersecurity, we believe AI/ML is having a similar impact. It is enabling the creation of new billion-dollar markets.

Fundamental changes affecting cybersecurity are a) adoption of open-source and cloud models, b) transformative application workloads and the changing CI/CD landscape, c) automation of attacks by bots, d) expansion of the attack surface due to numerous trends including the IoT and e) of course, the perennial issue of a lack of cybersecurity talent. To address these issues, the use of AI/ML in the cybersecurity industry has become essential. Overall, we are also seeing

an acceleration in training, inference, edge-data distribution, unique datasets and the like enabling high-performing security solutions.

Which areas in cybersecurity have benefitted the most from innovations in AI/ML?

The existing cybersecurity subsectors that have benefitted the most from AI/ML are endpoint security, network security and the SIEM/SOC (Security Operations Center). We were fortunate to be an early investor in Cylance—perhaps the initial “AI-first” cybersecurity startup to have a unicorn exit. Cylance was able to use sophisticated AI models to detect malware much earlier than established players that relied on signature-based models. Cylance sold to Blackberry for \$1.4 billion, changing the perceptions of exit valuations for these types of companies.

Companies like Darktrace, Vectra and Lastline are using AI/ML in network security. SIEM/SOC is another cybersecurity market that is ripe for change. It is the heart of cybersecurity and has a painful signal-to-noise ratio as the number of alerts thrown by cybersecurity products has increased faster than the number of real attacks.

We made an early bet on JASK, which is driving the concept of Autonomous SOC (analogous to autonomous cars).

Is AI/ML enabling new markets in cybersecurity?

New cybersecurity markets that are starting to benefit from AI/ML include anti-bot security, IoT security, Infrastructure as a Service Security and DevOps Security. Twistlock, one of our portfolio companies, is a fast-growing player in microservices and container security. ML is a key part of their success. Today, one third of all internet traffic is attributed to malicious bots that steal content and credentials. If attacks can be automated, then defense can also be automated. We invested in Cequence Security to automate the fight against bots.

How has the expansion of the IoT impacted your investments in the current environment?

The IoT means there are more assets to protect, which presents new security challenges by expanding the attack surface to bad actors. IoT security requires asset visibility and anomaly detection. ZingBox, another of our portfolio companies, is a market leader in IoT security. The reason they have won the confidence of top hospitals and



Founded: 2012
Founders: Stuart McClure, CEO (pictured), and Ryan Perme, Chief Scientist
VC raised: \$327 million
Funding rounds: 5
Exit: February 21, 2019 to BlackBerry
Transaction size: \$1.4 billion



“Artificial Intelligence and Machine Learning played a key role in the accelerated growth of Cylance from founding in 2012 to \$1.4B sale to Blackberry in 2019. Our customers can identify threats before they appear in the wild, get a 99% catch rate on malware and save 98% on reimaging costs because we have been able to use the latest AI/ML modeling to detect and protect against both unknown & known malware.”

manufacturing companies is due to the robustness of the AI models built by their PhDs from top data science schools such as Stanford and UC Berkeley. We are in the early days of IoT security, but we believe that effective IoT security is not possible without using AI/ML.

To use AI/ML effectively, in cybersecurity or other sectors, what other accompanying innovations are required?

We are a full stack investor. We invest from the silicon layer all the way up to applications. Some of the most important innovations in AI/ML are taking

place at the silicon level. Companies like Graphcore, a DTC Series A investment, seek to speed-up AI training by 100x compared to state-of-the-art GPUs. We also need to productize AI-based business applications—the goal of Noodle.ai. We will protect AI model training—i.e., how do we make sure AI models are trained with the right data. Imagine someone hacking into the training system for an autonomous car, for example, and feeding in malicious training data.

It is safe to say that AI/ML is significantly accelerating the creation of new cybersecurity unicorns.

Methodology

Industry

Using PitchBook’s dedicated verticals of cybersecurity and AI/ML, we then added in companies with primary industry codes including network management, automation/workflow and application software solutions to curate the dataset examined in this report.

Deals

PitchBook includes equity investments into startup companies from an outside source. Investment does not necessarily have to be taken from an institutional investor. This can include investment from individual angel investors, angel groups, seed funds, VC firms, corporate venture firms, and corporate investors. Investments received as part of an accelerator program are not included, however, if the accelerator continues to invest in follow-on rounds, those further financings are included.

Angel & seed

PitchBook defines financings as angel rounds if there are no PE or VC firms involved in the company to date and it cannot be determined if any PE or VC firms are participating. In addition, if there is a press release that states the round is an angel round, it is classified as such. Finally, if a news story or press release only mentions individuals making investments in a financing, it is also classified as angel. As for seed, when the investors and/or press release state that a round is a seed financing, or it is for less than \$500,000 and is the first round as reported by a government filing, it is classified as such. If angels are the only investors, then a round is only marked as seed if it is explicitly stated.

Early-stage

Rounds are generally classified as Series A or B (which we typically aggregate together as early stage) either by the series of stock issued in the financing or, if that information is unavailable, by a series of factors including: the age of the company, prior financing history, company status, participating investors, and more.

Late-stage

Rounds are generally classified as Series C or D or later (which we typically aggregate together as late stage) either by the series of stock issued in the financing or, if that information is unavailable, by a series of factors including: the age of the company, prior financing history, company status, participating investors, and more.

Proven. Potential.

The Dell Tech Capital team of investors helps passionate startups build companies, grow ideas, and change industries. Our investments have unique access to the go-to-market capabilities of Dell Technologies.

Learn More at DellTechCapital.com