

EMERGING TECH RESEARCH

Vertical Snapshot: Generative AI

VC trends, industry overview, and market landscape



2023

REPORT PREVIEW

The full report is available through the PitchBook Platform.



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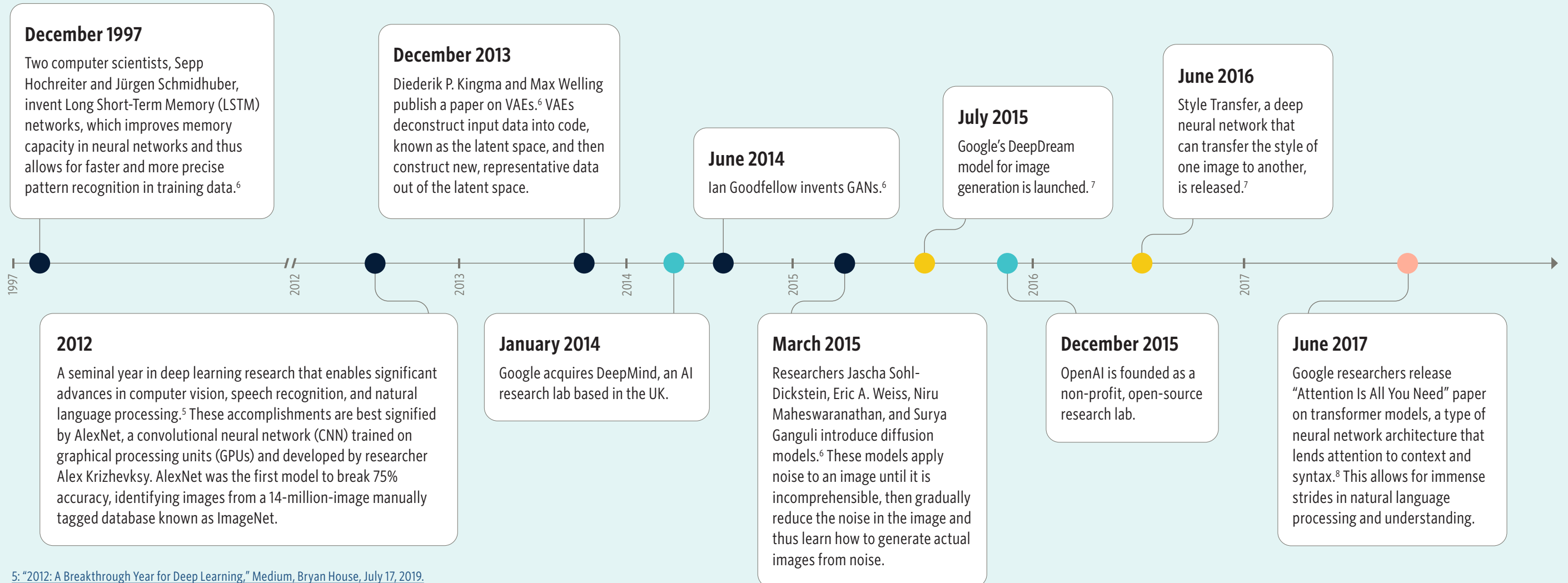
Executive summary

- **VC investments soar in natural language interfaces, 2D media, AI Core, and biotech startups.** Between 2018 and 2022, natural language interfaces and 2D-media generation captured 29.3% and 18.8% of VC-backed deals, respectively, and 23.6% and 11.4% of total dollars invested, respectively, in the generative AI space, making them the leading applied segments of the technology. Within the natural language interfaces segment, chatbots, voicebots, and personal assistants captured \$544.9 million in 2022—or 59.6% of all dollars invested in the segment. For the 2D media segment, avatars and video generation and editing accounted for 37.7% and 40.8%, respectively, of all VC dollars invested in the segment in 2022. AI Core, which includes foundation model developers and infrastructure for model development, raised a whopping \$5 billion from VCs between 2018 and 2022. Remarkably, even biotech startups utilizing generative techniques have been hot destinations of VC capital—with \$1.6 billion invested during the same period.
- **Lower training costs and advances in research propel in-house teams and startups.** The declining cost of foundation model training and usage, along with advances in artificial intelligence & machine learning (AI & ML) research, is driving the industry forward, making it possible for both in-house research teams and research-oriented startups to thrive. With hardware optimization and customized software, competitive foundation models can now be trained at significantly lower costs. As more AI researchers move from academia to the private sector, companies will compete for talent, and startups that simultaneously dedicate resources to model and product development will be more competitive.
- **Hyperscalers investing heavily in startups.** Cloud providers recognize that leading innovation in generative AI algorithms comes from startups; these providers are both making significant acquisitions and striking generous partnerships to align themselves with the future of creative software. Microsoft's \$10.0 billion financing commitment for OpenAI and Alphabet's VC mega-deals for Anthropic and Cohere stand out for their scale, yet Meta, Spotify, and Apple have made significant acquisitions in generative audio as well. These investments come after a relatively quiet period for hyperscaler acquisition activity in AI, demonstrating that tech giants now require urgency to prevent disruption.
- **New business opportunities from generative foundation models will rely on user experience.** Generative foundation models are still in their infancy, but this presents an exciting chance for basic innovation to produce better user experiences. We have already seen commercially successful products based on generative transformer and score-based diffusion models, so a solid precedent exists for future research and development to yield results within just 18 to 24 months. And as model capabilities continue to advance, new business models and applications will likely emerge, including exciting experiments with video, voice, scientific publications, and databases. However, it is crucial to ensure that foundation models have guardrails in place to guarantee trustworthy outcomes. For startups looking to take on industry incumbents, the keys to success will be user experience, customization, and access to proprietary data.
- **The generative AI market is expected to grow, with a multitude of enterprise applications.** Generative-relevant use cases already present a significant enterprise opportunity, estimated to reach \$42.6 billion in 2023, with natural language interfaces offering the largest market due to customer service and sales automation use cases. We expect the market at a 32.0% CAGR to reach \$98.1 billion by 2026, even without accounting for the potential of generative AI to expand the total addressable market of AI software to consumers and new user personas in the enterprise.



Generative AI timeline

● General model research ● Image / video models ● Text models ● Business events



5: "2012: A Breakthrough Year for Deep Learning," Medium, Bryan House, July 17, 2019.

6: "The Generative AI Revolution Has Begun—How Did We Get Here?," Ars Technica, Haomiao Huang, January 30, 2023.

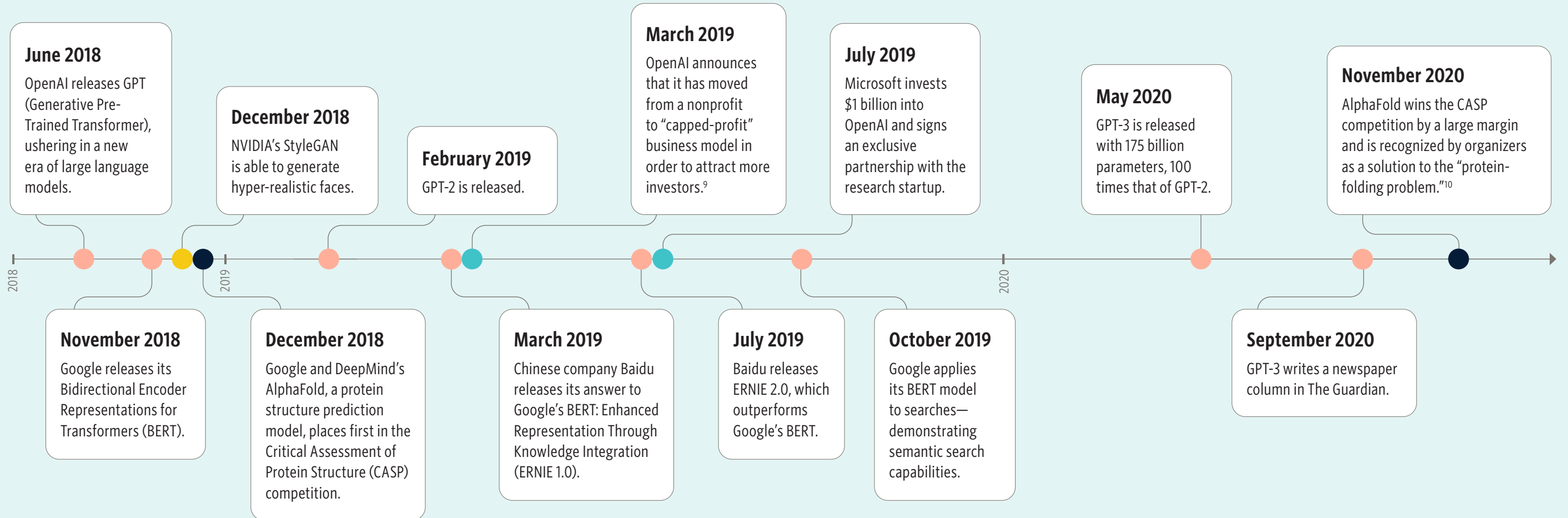
7: "Timeline of Text-To-Image Machine Learning Models," Fabian Mosele, n.d., accessed March 9, 2023.

8: "Timeline of AI and Language Models," Life Architect, Alan D. Thompson, n.d., accessed March 9, 2023.



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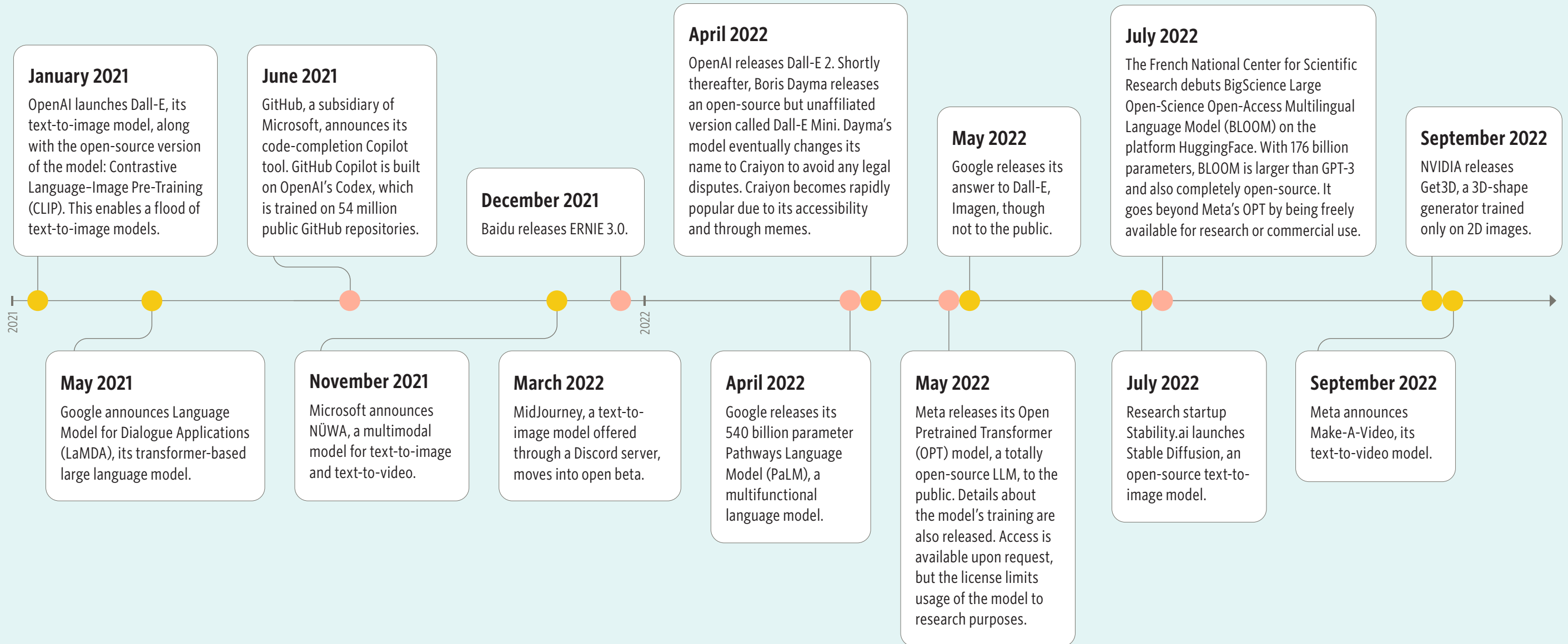
9: "OpenAI Shifts From Nonprofit to 'Capped-Profit' to Attract Capital," TechCrunch, Devin Coldewey, March 11, 2019.

10: "DeepMind's Protein-Folding AI Has Solved a 50-year-old Grand Challenge of Biology," MIT Technology Review, Will Douglas Heaven, November 30, 2020.



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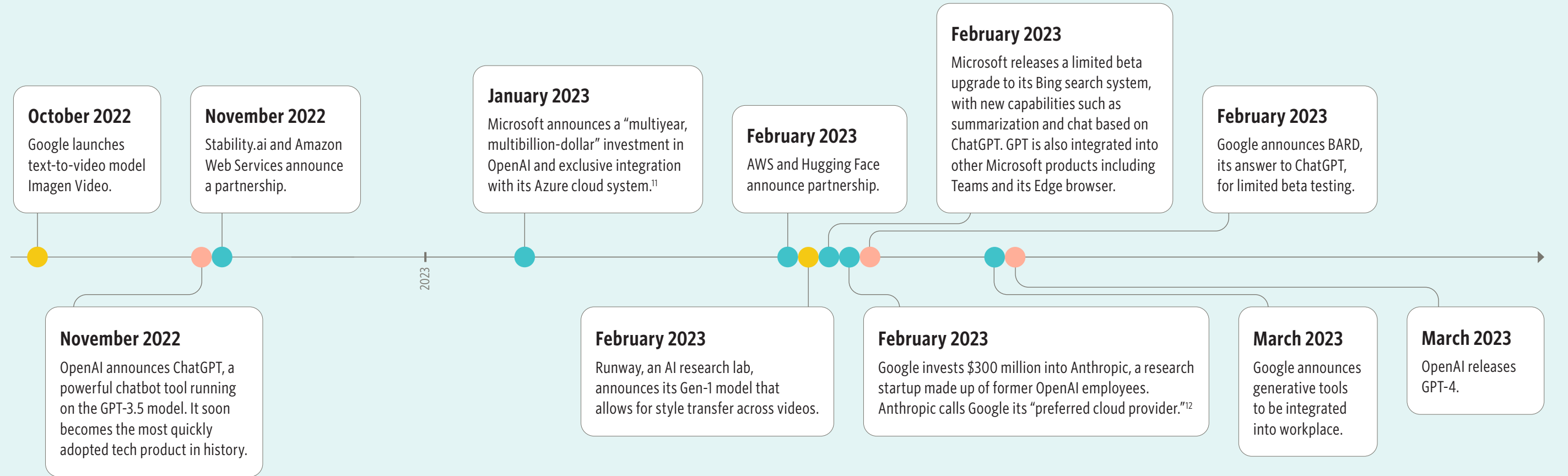
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GENERATIVE AI TIMELINE

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11: "Microsoft Announces New Multibillion-Dollar Investment in ChatGPT-Maker OpenAI," CNBC, Ashley Capoot, January 23, 2023.
12: "Google Invested \$300 Million in AI Firm Founded by Former OpenAI Researchers," The Verge, James Vincent, February 3, 2023.



GENERATIVE AI TAXONOMY

2D media

Companies in this segment produce, manipulate, or identify flat digital content—images, videos, or other media that lack spatial depth. These tools enable use cases in marketing, design, entertainment, and e-commerce.

Models: DALL-E ([OpenAI](#)), [Midjourney](#), [Stable Diffusion \(Stability.AI\)](#), [Make-A-Video \(Meta\)](#), [Imagen Video \(Google\)](#)

| | | |
|--------------------------------------|---|--|
| Avatars | Digital representations of individuals or groups of people used in personalized videos, virtual assistants, or e-commerce. | Soul Machines , Synthesia , DeepBrain AI |
| Content suite | Automated content creation and optimization of multiple forms of digital media for content marketing, advertising, and presentations. | Lightricks , Jasper , Tome |
| Image: Generation and editing | Creation, modification, and enhancement of digital images for graphic design, photography, and e-commerce. | Imagen , PhotoRoom |
| Product design | Assistance with the design and development of physical products such as clothing and furniture using generative design techniques. | ZMO.AI , CALA |
| Video: Generation and editing | Automated video editing, enhancement, and generation for video production, advertising, and entertainment. | Runway , VideoVerse , Waymark |
| Visual search | Automated identification and categorization of visual patterns in images and videos for e-commerce, content discovery, and analytics. | Air , Twelve Labs |

3D media

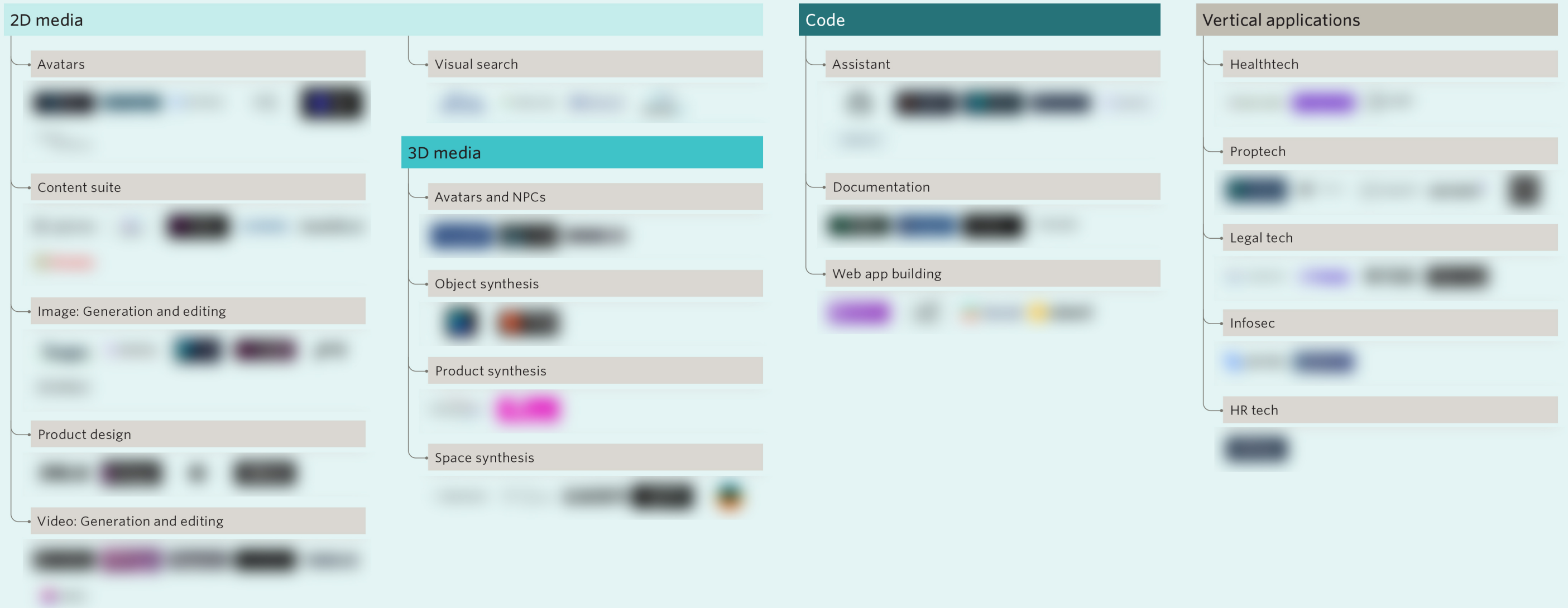




Generative AI market map

Click to view the interactive market map on the PitchBook Platform.

Market map is a representative overview of venture-backed or growth-stage providers in each segment. Companies listed have received venture capital or other notable private investments.

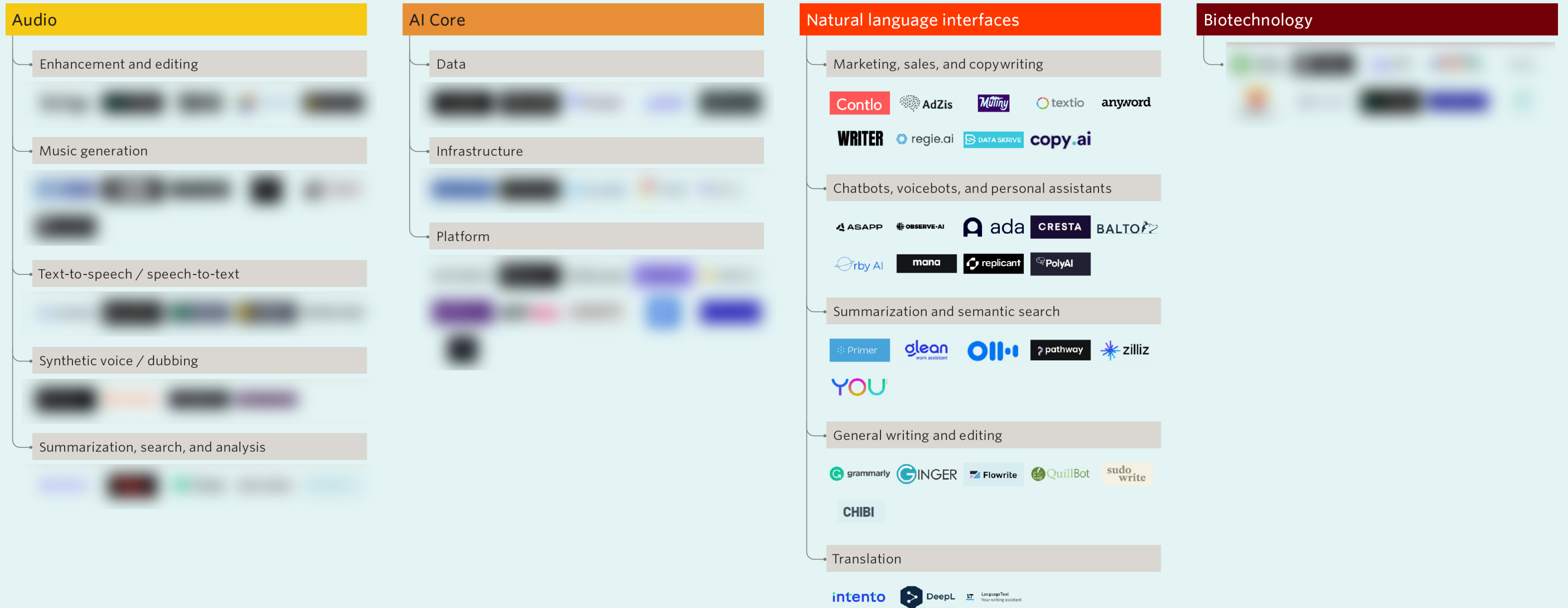




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About PitchBook Emerging Tech Research

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As the private markets continue to grow in complexity and competition, it's essential for investors to understand the industries, sectors and companies driving the asset class.

Our Emerging Tech Research provides detailed analysis of nascent tech sectors so you can better navigate the changing markets you operate in—and pursue new opportunities with confidence.

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