

Samsung's use of AI for chip design signals industry shift away from dominant suppliers

Article

The news: Samsung is using artificial intelligence (AI) to automate the highly complex process of designing cutting edge computer chips, [per](#) Ars Technica. The Korean tech company, which

is the world's **top** chipmaker by revenues, hopes to accelerate R&D of future chips, and chip competitors like **Google**, **IBM**, and **NVIDIA** are following suit.

- Using an AI approach in new software from **Synopsys**, a leading chip software design company, Samsung is creating **complex chips**, like the Exynos processor, which will run its smartphones, tablets, and PCs.
- The protracted global **chip shortage** has disrupted various industries by causing **delays** to product launches, limiting supply, and raising prices for manufacturers, which has in turn been **passed on** to consumers.
- Furthermore, the shortage has exposed **the dangers of relying on a few dominant chip suppliers**, and pushed manufacturers to consider **making their own chips**.

Here's how it works: Samsung's use of Synopsys' AI employs a machine-learning (ML) technique called '**reinforcement learning**' to work out chip designs. Reinforcement learning involves training an algorithm to perform a task through reward or punishment; it has yielded apparently good results as **an effective way of capturing subtle and hard-to-codify human judgment**.

While this methodology has been pioneered with Samsung, it has the potential to become an industry standard for manufacturers like **NVIDIA** and **IBM**, which are looking to ramp up bespoke **chip design**.

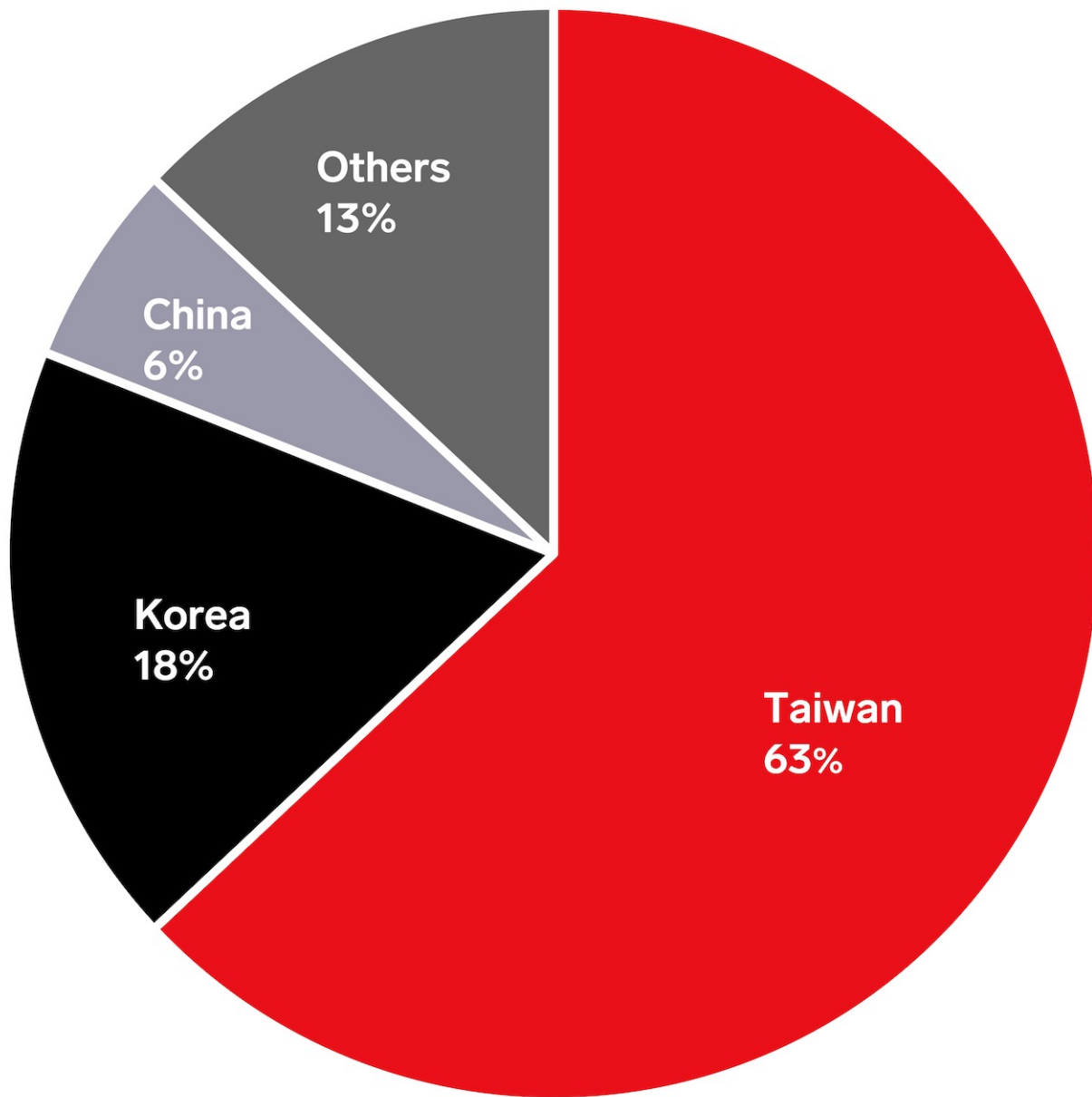
- **AI has the potential to change how chips are made.** Google released a **paper** outlining how it used AI to develop its Tensor chip, which is coming to their Pixel line of smartphones, and has replaced traditional Qualcomm processors.
- Synopsys has its own advantage too: years of **cutting-edge semiconductor designs** that can be used as the foundational data set to train an AI algorithm.

The opportunity: If companies like Samsung, Google, NVIDIA, and IBM can successfully harness AI to develop future chips, they could inspire other companies to do the same.

- Developing chips in-house could lead to **the creation of novel chips for tailored applications**, as well as less reliance on a handful of chip suppliers.

Global Foundry Revenues, by Country, 2020

% of total



Note: Total foundry revenues totaled \$85.13 billion in 2020. Taiwan-based TSMC made up 54% of global foundry revenues.

Source: TrendForce, March 2021

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