

**UNITED STATES  
PATENT AND TRADEMARK OFFICE**



# Artificial Intelligence (AI) trends in U.S. patents

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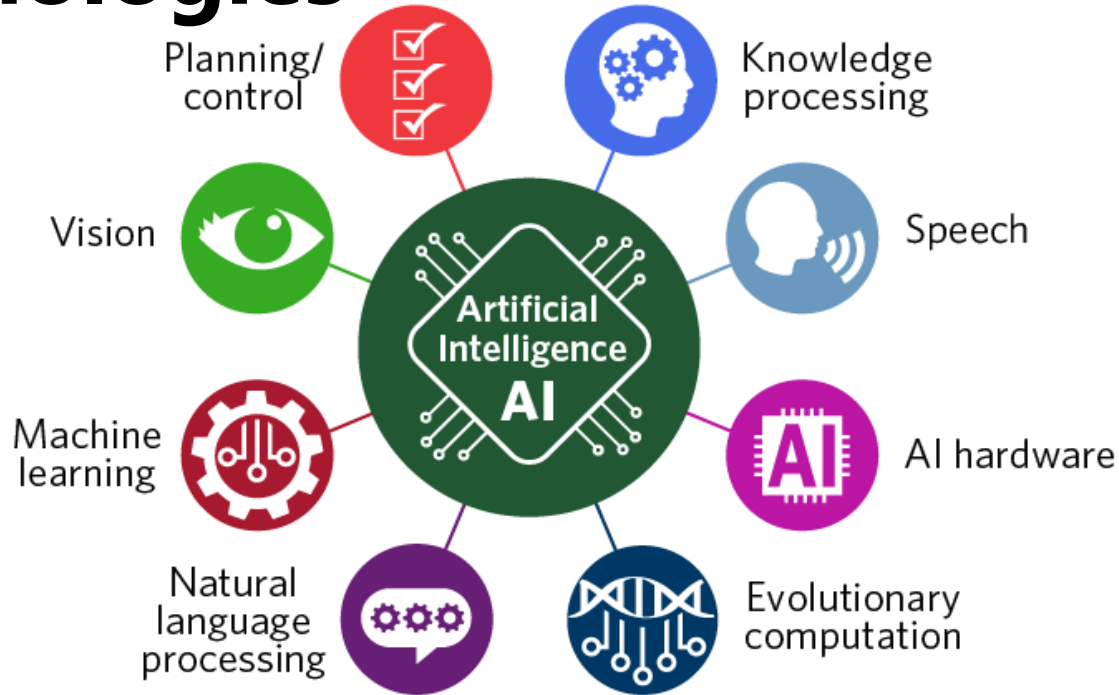
# Purpose and Outline

- **Purpose:**
  - In response to requests for information on AI patents (including the NSCAI report), the Agency created additional metrics on AI patent application and prosecution trends building on the Inventing AI report
- **Outline:**
  - Trends in U.S. AI patenting
  - Allowance rates in AI applications

# Background: Recent OCE studies

- USPTO IP Data Highlights report *Inventing AI: Tracing the diffusion of artificial intelligence with U.S. patents*, Oct 2020
  - Analysis of U.S. AI patenting 1976-2018
  - Diffusion of AI across technologies, inventor-patentees, organizations, and geography
- Release of AI Patent Dataset (AIPD), Aug 2021
  - AI-related PGPubs and patents through 2020
  - Extends *Inventing AI* data by two years
- This analysis updates select *Inventing AI* analyses and adds additional areas of interest

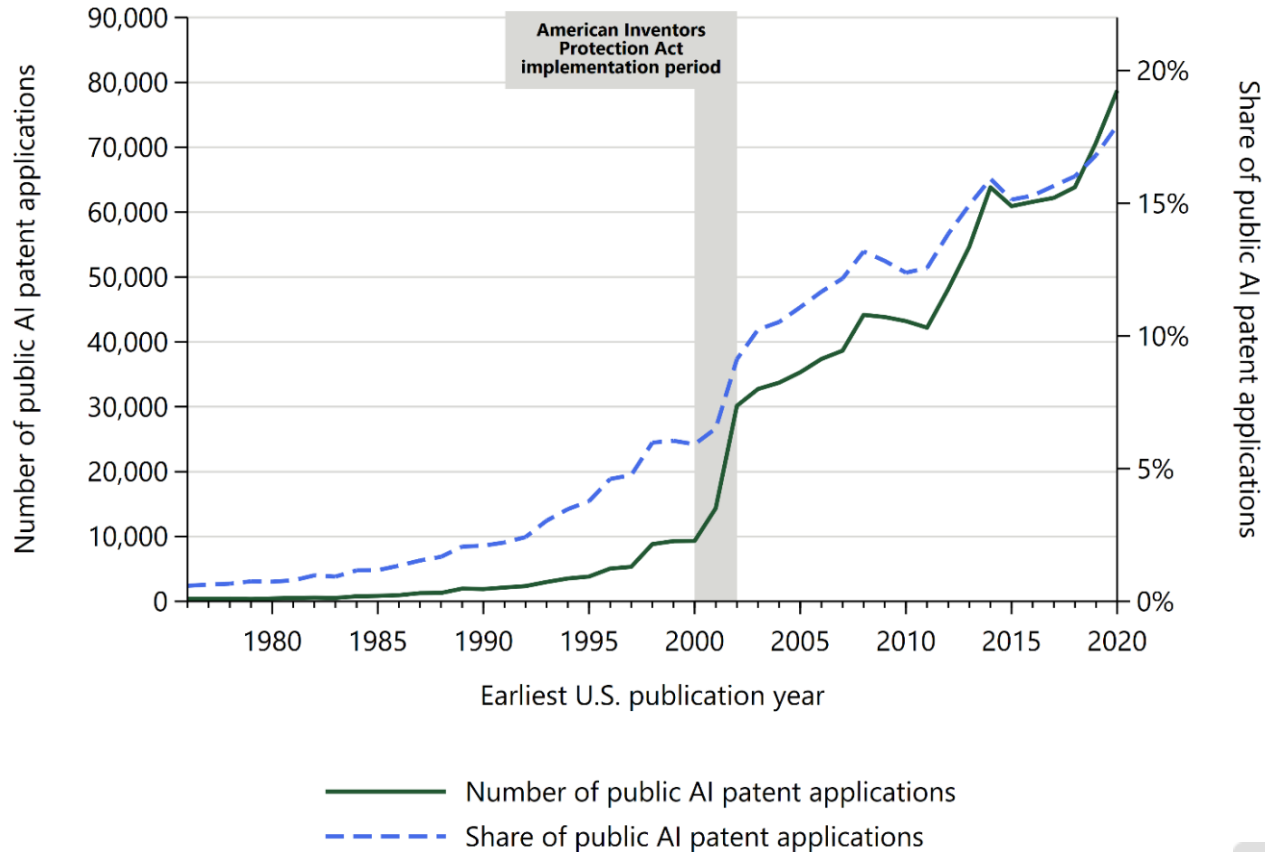
# Background: AI component technologies



Other definitions of AI are useful for AI policy making and operational processes at the USPTO. This definition of AI is from the Inventing AI report and is not the official definition used by the USPTO.

# Trends in U.S. AI patenting

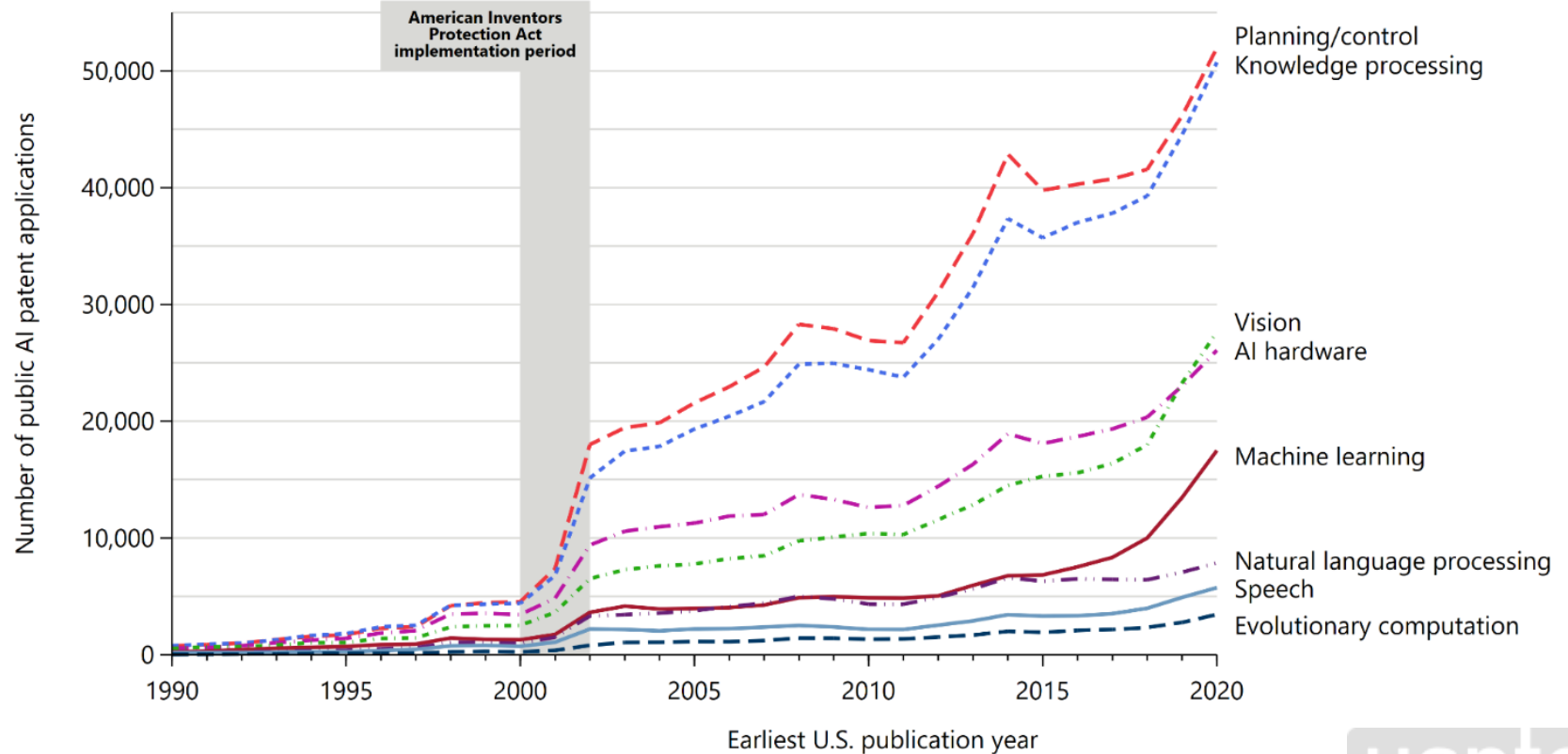
# Volume and share of public U.S. AI patent applications, 1976–2020



The earliest U.S. publication year is either the year of the first pre-grant publication for a granted or, if there is no pre-grant publication, the year a granted patent was published.



# Volume of public U.S. AI patent applications by AI component, 1976–2020

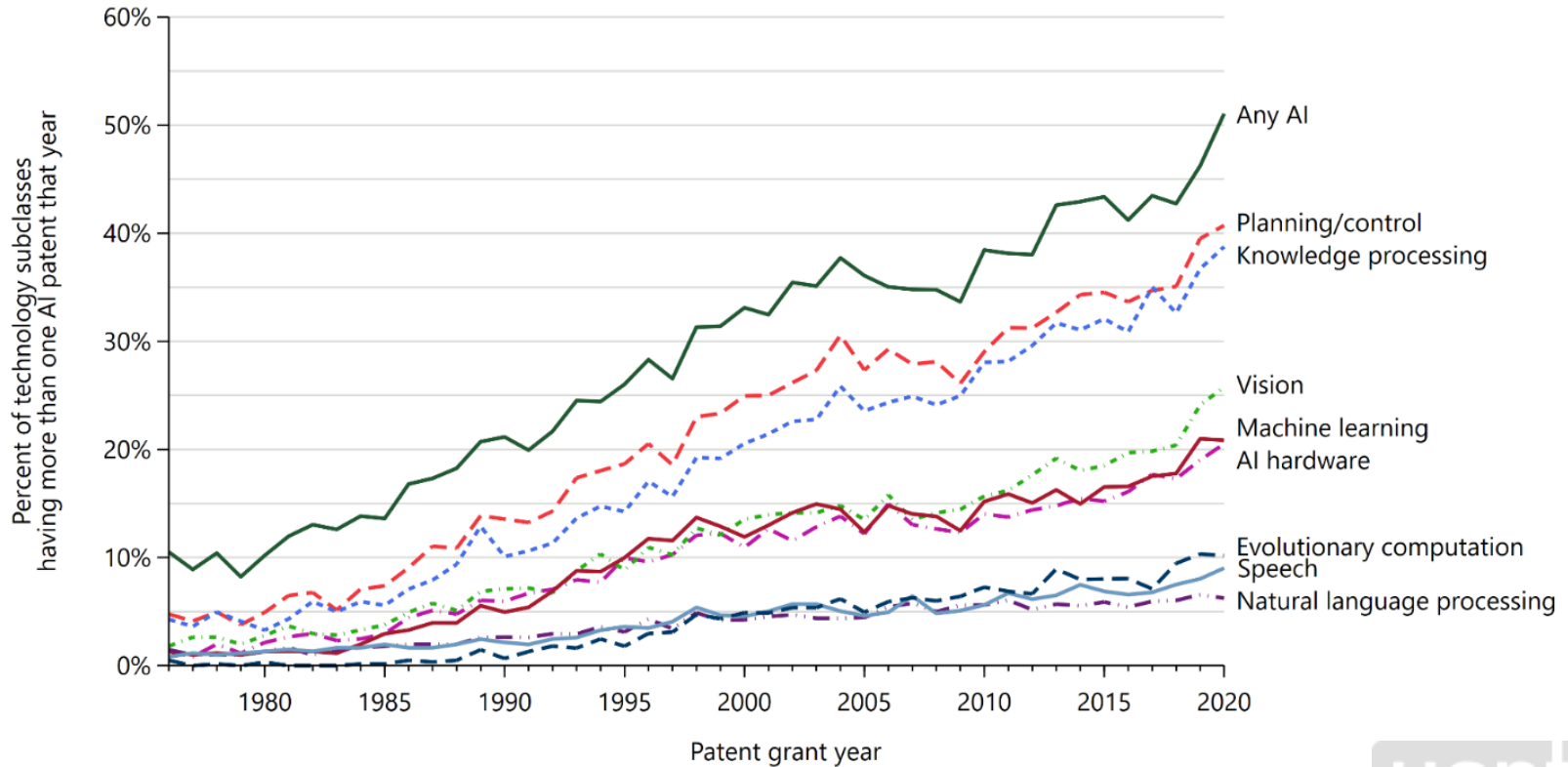


A single PGPub or patent may be classified in more than one AI component technology. The earliest U.S. publication year is either the year of the first pre-grant publication for a granted patent or, if there is no pre-grant publication, the year a granted patent was published.





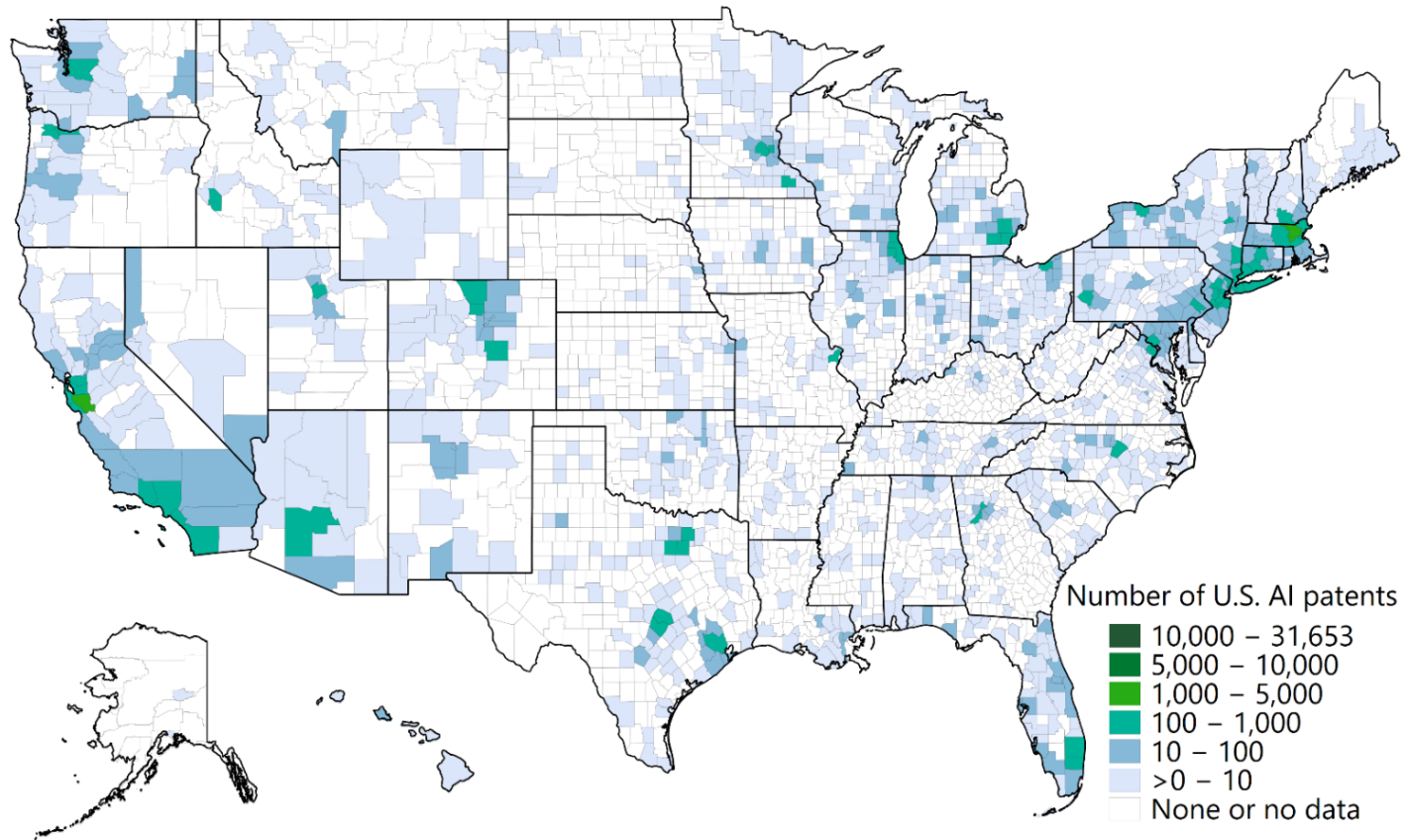
# Diffusion of AI across patent technology subclasses, overall and by AI component, 1976-2020



Based on April 2021 Master Classification File (MCF); 0.34% of patents have multiple CPC First that are different at subclass level.

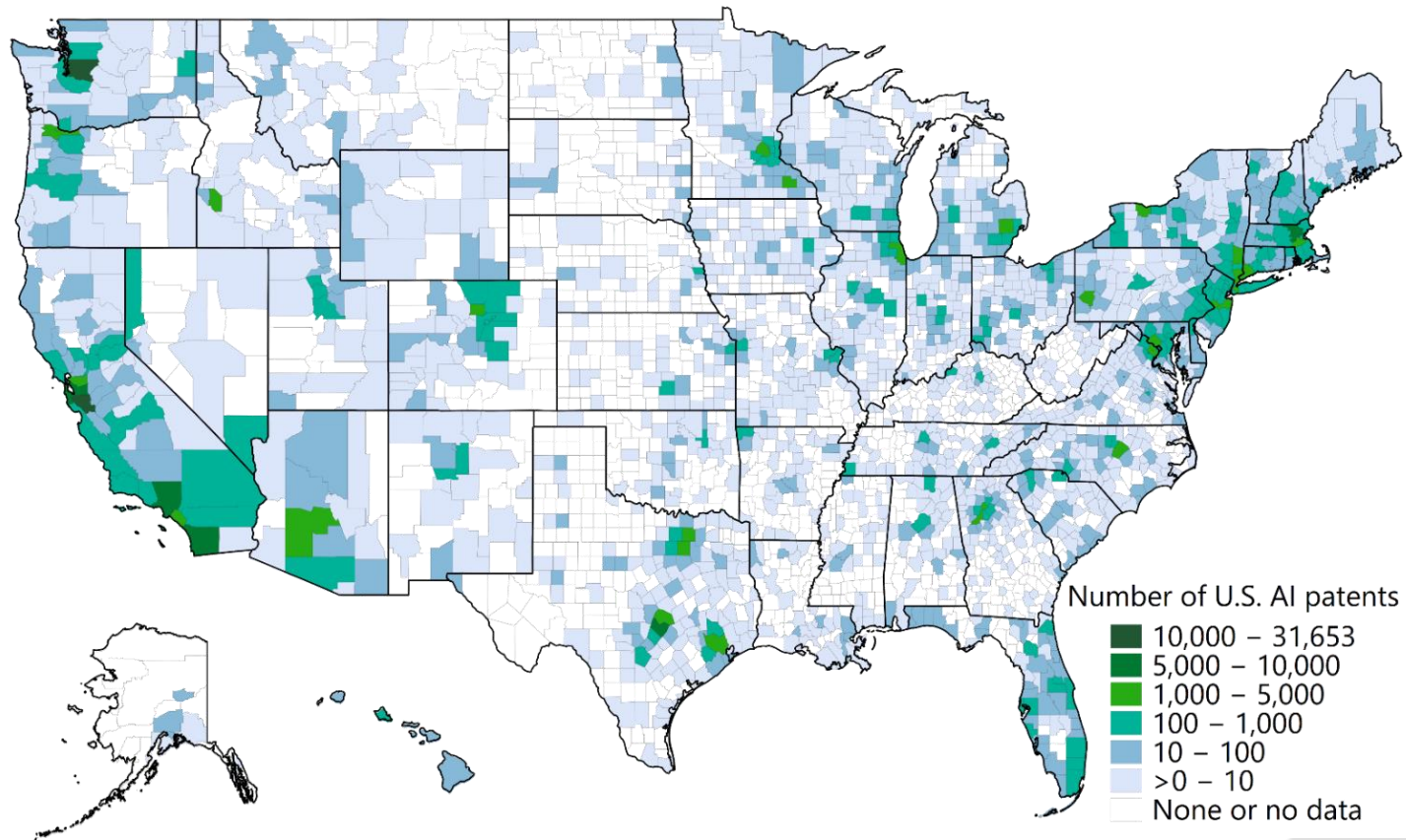


# Count of U.S. AI patents by inventor location, 1976–2000



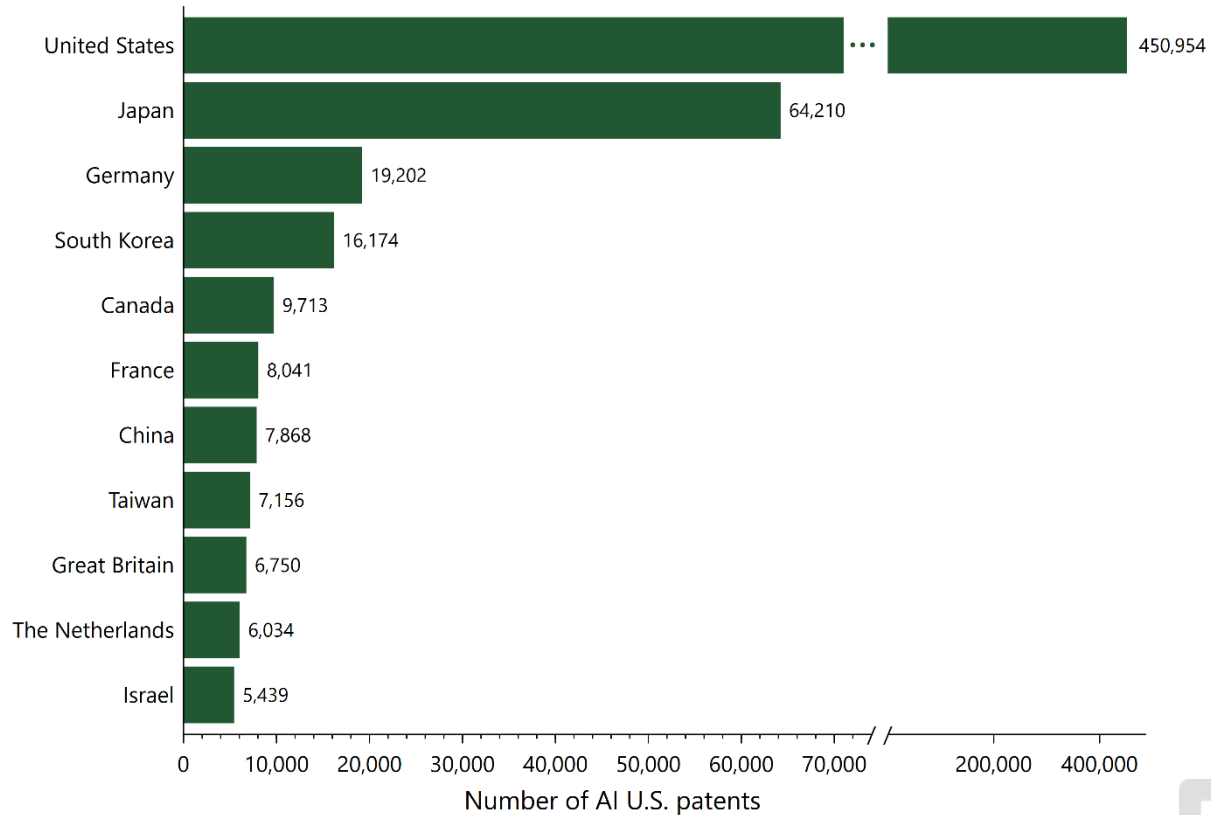
Counts based on fractional inventor-county patent counts.

# Count of U.S. AI patents by inventor location, 2001–2020



Counts based on fractional inventor-county patent counts.

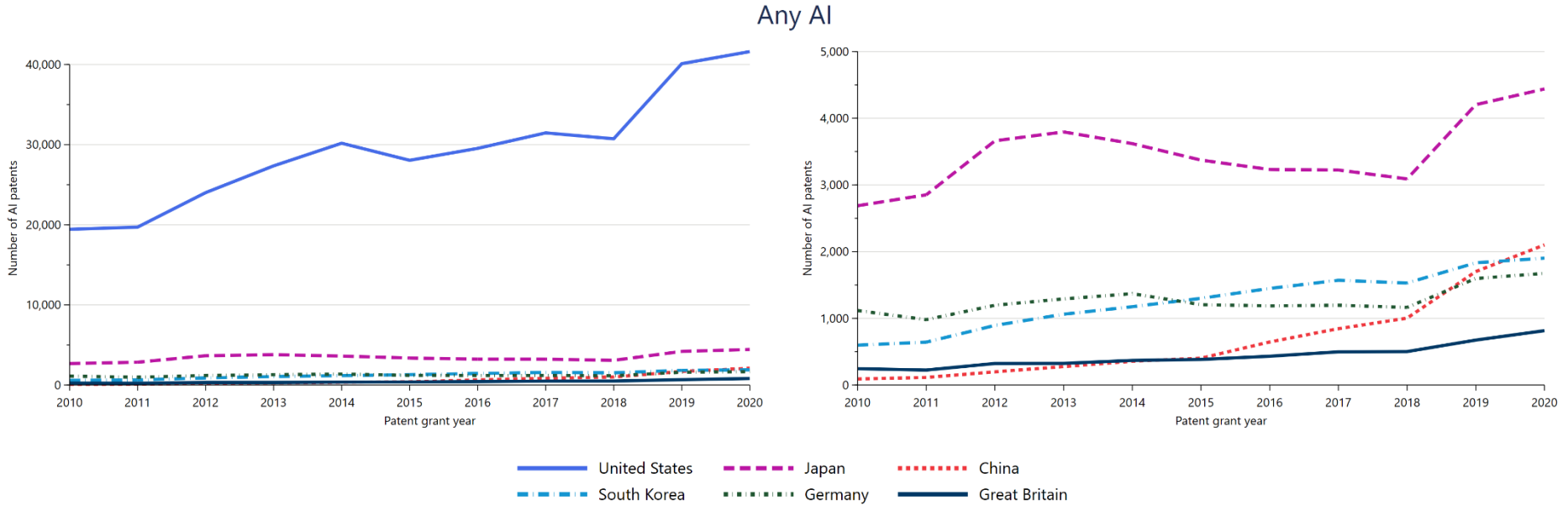
# U.S. and top 10 non-U.S. assignee-at-grant countries of U.S. AI patents, 1976-2020



Ranking based on totals from 1976-2020 using assignee-country fractional patent counts; excludes inventors who did not reassign patent rights prior to grant and non-inventor applicants presumed to be assignees at grant.



# Growth of U.S. and top 5 foreign country assignees (in 2020) of U.S. AI patents, 2010-2020

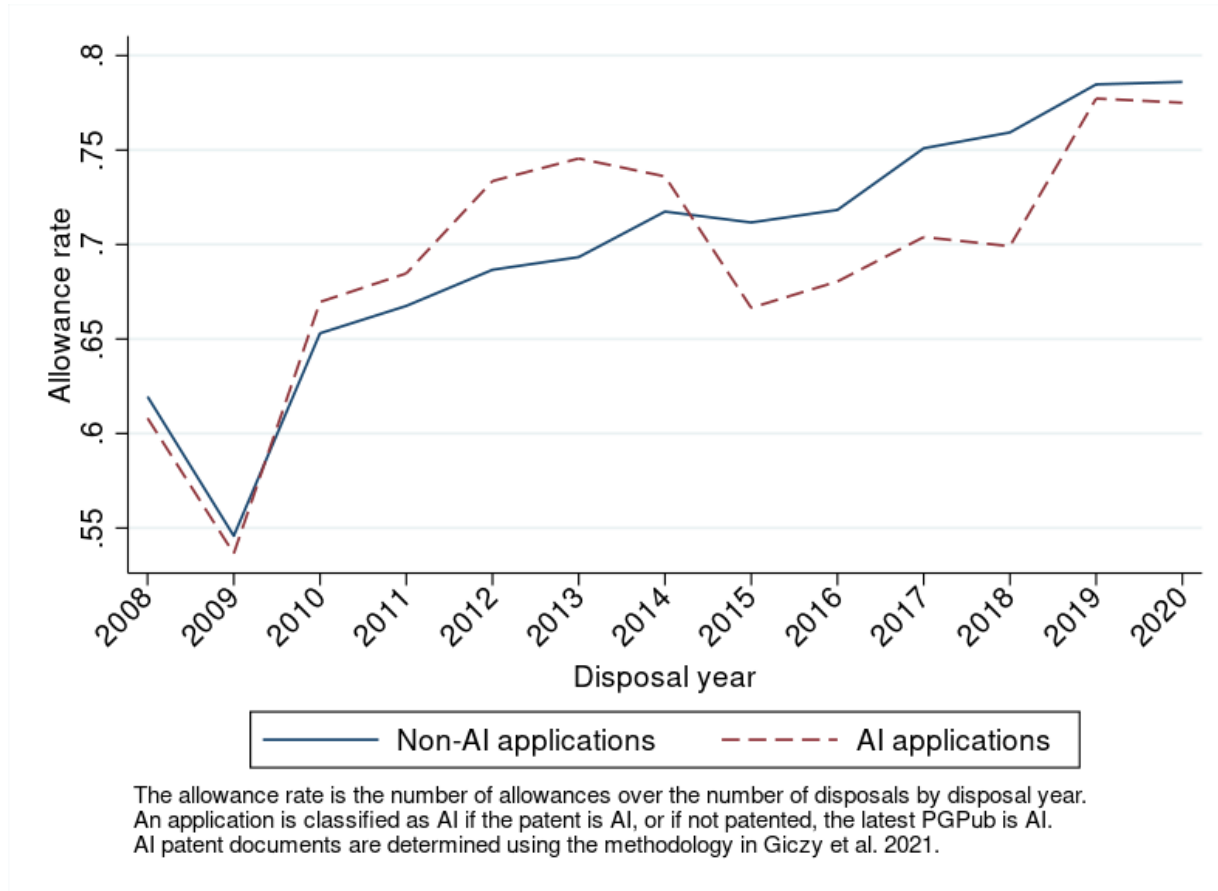


Ranking based on count of AI patents in 2020 using assignee-country fractional patent counts; excludes inventors who did not reassign patent rights prior to grant and non-inventor applicants presumed to be assignees at grant.



# Allowance rates

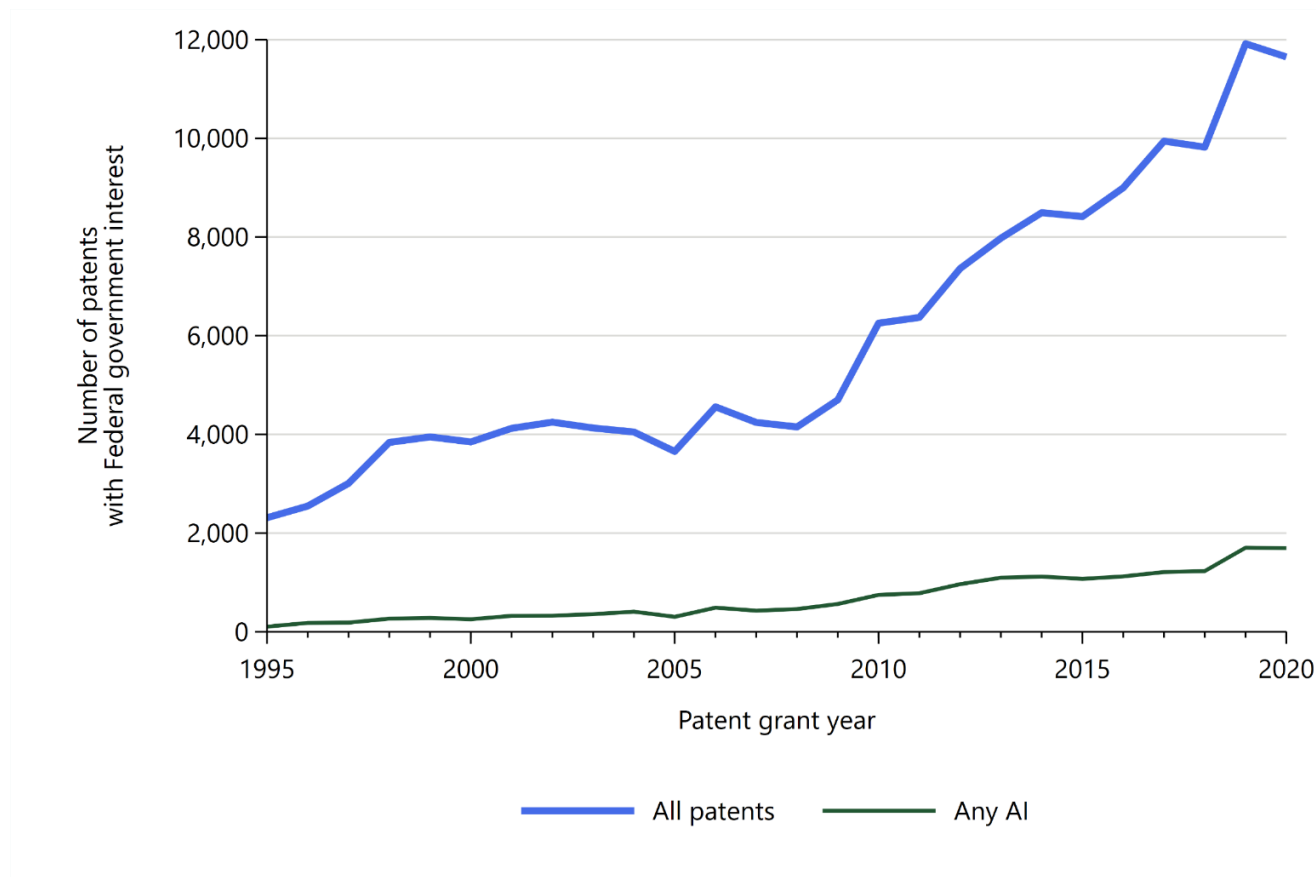
# Patent application allowance rates, 2008-2020



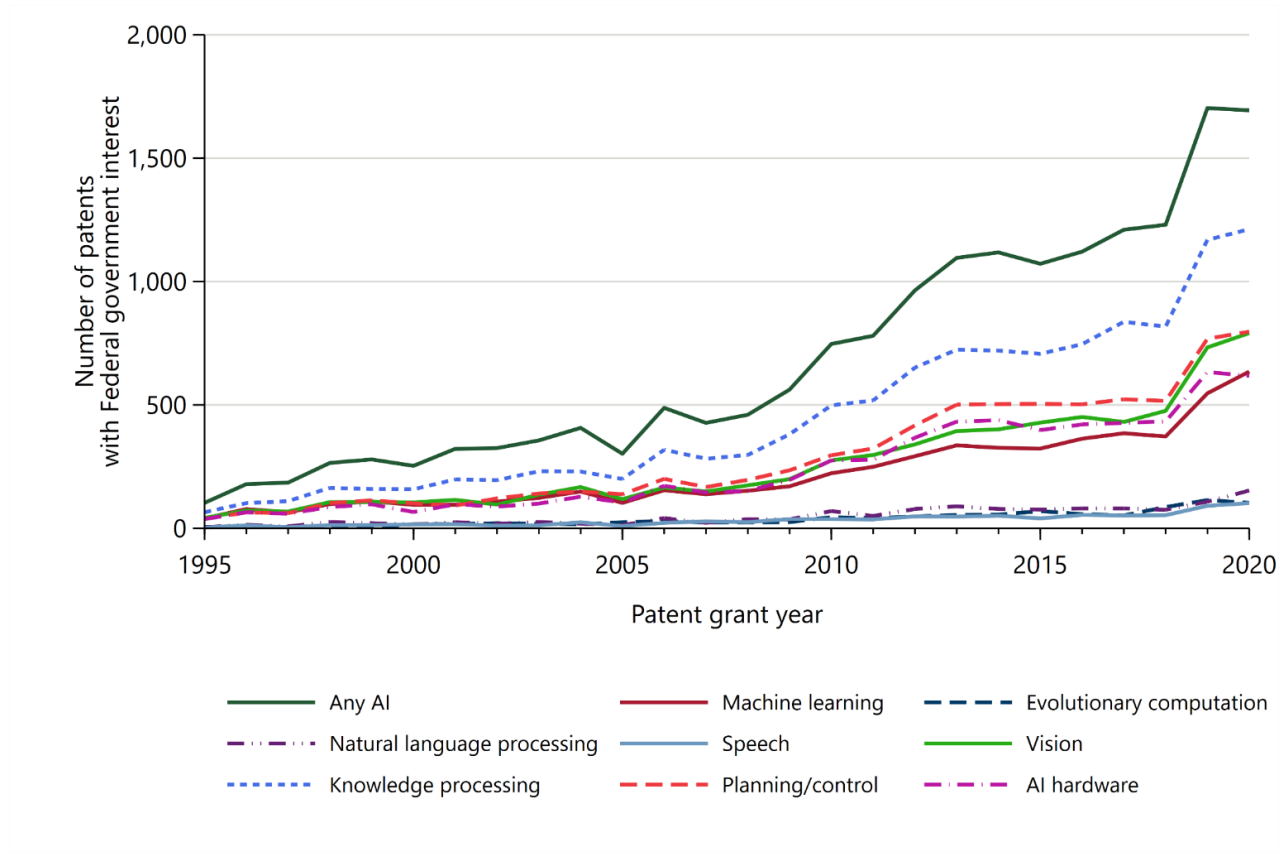
# **AI patents and government interest**



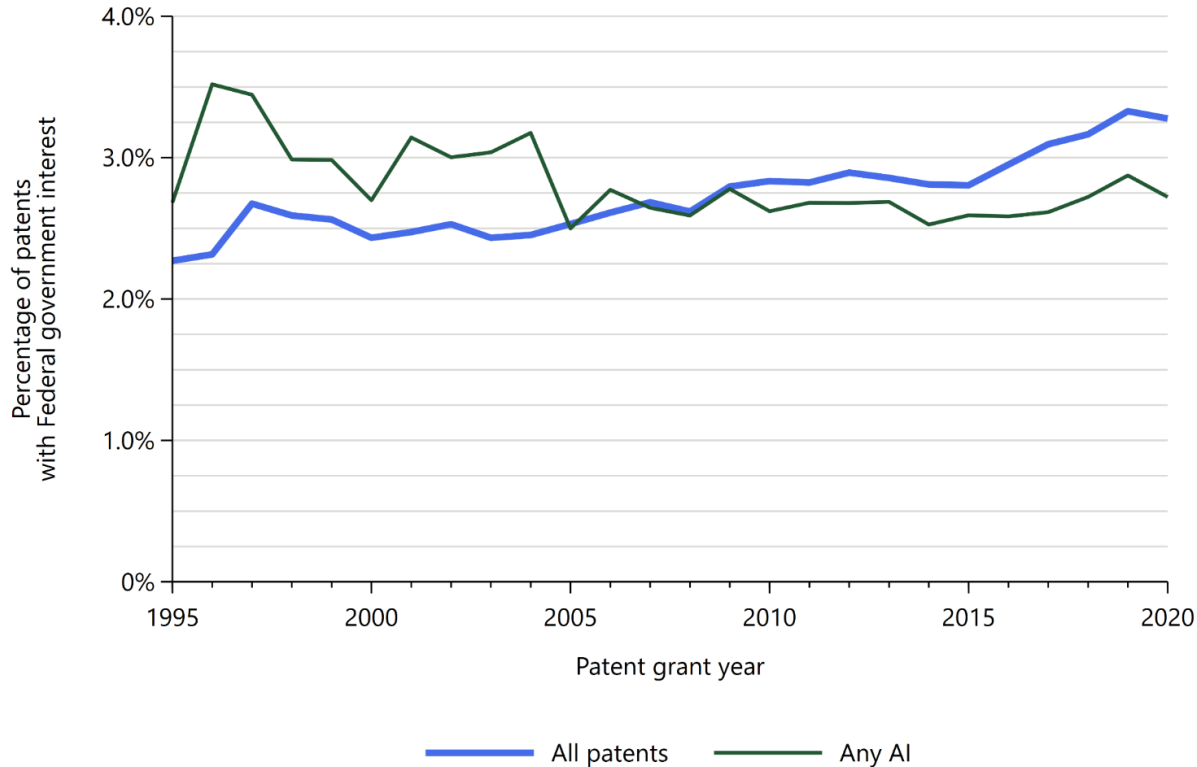
# Volume of AI patents with Federal government interest, 1995–2020



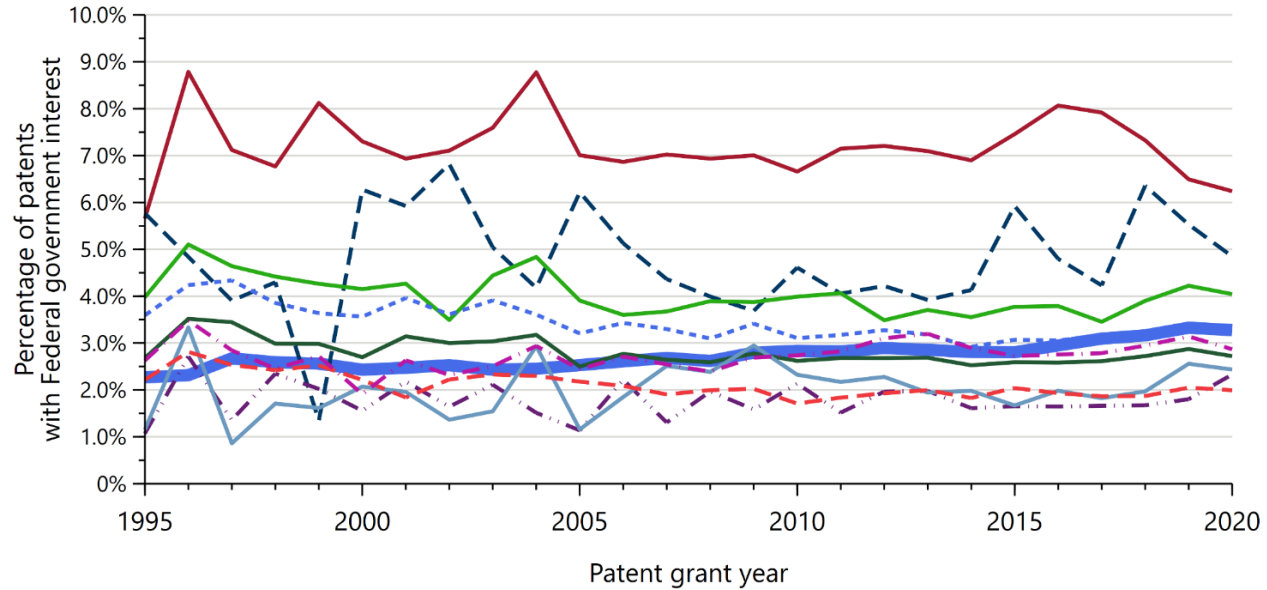
# Volume of AI patents with Federal government interest, by AI component technology, 1995–2020



# Percentage of AI patents with Federal government interest, 1995–2020



# Percentage of AI patents with Federal government interest, by AI component technology, 1995–2020





# Thank you!

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