

**UNITED STATES
PATENT AND TRADEMARK OFFICE**



Use of Artificial intelligence (AI) in Auto-Classification

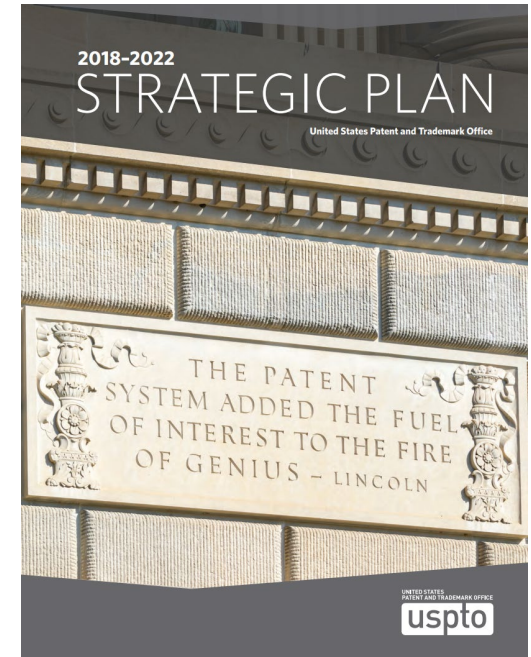
IPC Committee of Experts Meeting

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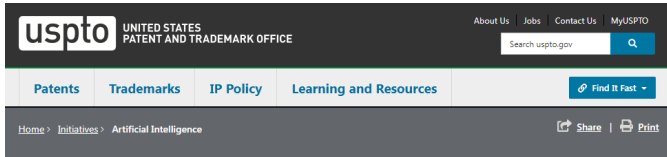


Artificial intelligence strategy

- 2018-2022 USPTO Strategic Plan:
 - Optimize development and delivery of information technology tools, including artificial intelligence and machine learning, for internal users of patent systems to ensure that they have the tools they need for a thorough search and examination.*



USPTO AI landing page



Artificial Intelligence



"The broad scope of new products and services that build on AI technologies suggests that AI has the potential to fundamentally change how people perceive the world around them and live their daily lives. This is the essence of technological progress, and realizing these changes happens through innovation." —[Inventing AI: Tracing the diffusion of artificial intelligence with U.S. patents](#)



Engagement

Browse USPTO leadership's speeches, blogs, and events about AI and learn more about our approach.

> [View past engagements](#)



Reports

Find our reports, Federal Register Notices (FRNs), and other important USPTO actions concerning AI policy.

> [View reports and notices](#)



Resources

Discover other resources for AI and learn about cross-government goals shared by other federal entities.

> [AI resources and goals](#)

www.uspto.gov/initiatives/artificial-intelligence

Artificial intelligence resources



Find a collection of resources devoted to shaping the Administration's and federal government's approach to artificial intelligence (AI).

USPTO directly engages with the following

- [Administrative Conference of the United States \(ACUS\)](#)
 - Charged with convening expert representatives from the public and private sectors to recommend improvements to administrative process and procedure. The Office of the Chairman of the Administrative Conference is exploring the growing role that AI, such as machine learning and related techniques, is playing in federal agency adjudication, rulemaking, and other regulatory activities.
- [IP5 New Emerging Technologies and Artificial Intelligence Task Force \(IP5 NET/AI TF\)](#)
 - Coordinates IP5 initiatives and is developing a roadmap for possible joint projects in these areas among the IP5 member offices.
- [National Science and Technology Council \(NSTC\), Machine Learning and Artificial Intelligence Subcommittee \(MLAI\)](#)
 - The interagency group oversees AI coordination among federal agencies. The USPTO actively participates in the MLAI to ensure intellectual property equities are accounted for during interagency discussions.
- [Networking and Information and Technology Research and Development \(NITRD\) Program, Artificial Intelligence Research and Development Interagency Working Group \(AI R&D IWG\)](#)
 - Coordinates federal AI R&D across 32 participating agencies and to support activities tasked by both the NSTC Select Committee on AI and the Subcommittee on Machine Learning and Artificial Intelligence (MLAI). AI R&D IWG gathers information from AI experts to ensure that government investment in AI R&D results in innovative applications to address the nation's challenges, advantage its opportunities, and promote U.S. leadership and global competitiveness.
- [National Security Commission on AI \(NSCAI\)](#)
 - An independent commission stood up by Congress to "consider the methods and means necessary to advance the development of artificial intelligence, machine learning, and associated technologies by the United States to comprehensively address the national security and defense needs of the United States."
- [US-UK Artificial Intelligence R&D Collaboration](#)
 - A working group comprised of representatives from agencies within the United States and the United Kingdom. The goal of this group is to oversee the initial implementation of the signed agreement between the US and the UK, including identifying and defining specific topic areas for R&D collaboration.



Recent AI policy developments

- Administrative Conference of the United States (ACUS) published a [statement on government agency use of AI](#)
 - Identifies issues agencies should consider when adopting or modifying AI systems

Patent auto-classification

Vision: Develop auto-classification system to generate CPC data to meet internal needs and international obligations for classification.

- The USPTO is developing and validating an AI-based auto-classification system
 - Full classification of patent documents
 - Identification of symbols associated with claims (called C* or “C-stars”)

CPC allocations	C*
G01S 7/4863	★
G01S 7/4865	★
G01S 7/4917	
G01S 13/89	★
G01S 7/4914	★
G01S 17/894	

Opportunities for value

- Support patent classification quality
 - Correctness
 - Completeness
 - Consistency
- Possible operational efficiency gains
- Potential for reductions of internal costs

AI considerations for CPC

- Over 260,000 symbols in the CPC scheme
- Supplemental information on symbols that is included in scheme guidance and definitions
- Hierarchical structure having up to 12 levels of indents
- Periodic updates to the CPC scheme
- Multiple symbols may be allocated to a patent document
- Classification used for search and application assignment

Auto-classification assessments

- Intellectual validation of full classification system
 - Currently produces ranking CPC symbols for patent documents
 - Some examples where tool appears to produce output closer to classifications already assigned to patent documents
 - Some examples where tool appears to produce output divergent from classifications already assigned to patent documents
- Intellectual validation of auto-classified C*
 - Results indicated readiness for phased implementation with monitoring

	Auto-classified C*	Applied C*
F ₁ score	76 %	78 %



Outlook for auto-classification

- Further development of full classification system to select CPC symbols appropriate for patent documents
- Implement auto-classification for C*
 - Started Dec. 2020 for portion of new utility patent filings
 - Monitoring quality of auto-classified C*
 - Evaluating value of expanding auto-classification for C*
- Continue to leverage international partnerships to further enhance AI efforts on classification