Patenting AI; an EPO perspective

Industrial revolutions and the patent system

1st industrial revolution
steam energy, coal, transport
Hardware technology

1784  |  1870

2nd industrial revolution
electricity, oil, mass production
Hardware technology

3rd industrial revolution
electronics and IT, flight, nuclear energy
Hardware and software technology

1960s  |  Today

4th industrial revolution
connectivity, software, artificial/distributed intelligence, the industrialisation of every process, renewable energy
Towards super-software technology
Internet of Everything (IoE)

The Impact of AI

Yesterday – Industry 3.0
- Automation of repetitive physical work
- robots replace blue collars
- Automated production

Tomorrow – Industry 4.0
- Automation of repetitive intellectual work
- AI replaces white collars
- Automated design
AI is 60 years old

- It has a long reputation for failing to deliver on its promises.
- So what's this excitement about it now? What's new?
  1. Algorithms – Deep Learning
  2. Computing Power - GPU
  3. Big Data – BIG!

And the resulting effect is disruptive:

Instead of people writing software  data writes software

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Artificial intelligence in European patent applications

**EP applications in core AI**

**EP applications related to AI**

Source: EPO. The number of European patent applications in core AI technologies corresponds to EP/WO families in the CPC class G06N7, G06N5, G06N99 and G06N93. The number of European patent applications related to AI is derived from a full text search for related machine learning terminology in a corpus of EP/WO families. The results are presented by oldest priority date.
Impact on Patents?

How does it impact the work of patent offices?

How does it impact the various professions dealing with patents?

Challenges and opportunities for patent offices

3 key areas

AI as a Computer Implemented Invention

AI finds prior art, invents and drafts patents

AI processes patents and assists decision making
What does this mean for the patent system?

All aspects of patenting: inventing, drafting, filing, representing, licensing, standards, monetizing ...

in any technical sector

will become fundamentally dependent on patent offices providing a predictable, stable and timely approach to the patenting of Computer Implemented Inventions (CII) / software, and on applicants understanding how to draft and prosecute appropriate applications.

AI and the patent system

The fundamental concepts of patent law are applicable

The fundamental concepts of patent law will adapt – from the protection of hardware innovation, to the protection of software innovation

- Concepts such as "industrial", "technical", "aesthetic", "abstract", "mental act" will become even more crucial to understand within the patenting process.
- Who/what is an "inventor" (99% machine invention)? The concept of inventor implies a human being: the inventive role of individuals and teams are relevant.
- Who is the person skilled in the art?
EPO approach to Artificial Intelligence

Use of AI

Treatment of AI applications

Areas where the EPO uses AI

- Automatic pre-classification of incoming patent applications to assign the file to the right unit.
- Automatic classification and re-classification of patent documents according to the CPC scheme.
- Performing automatic searches on incoming patent applications: selection and merging of documents sets with machine learning methods.
Areas where the EPO uses AI

- Automatic annotation of patent literature: indexing numerical values, chemical compounds.

- Machine Translation through Google's Neural Network based machine: 15,000 request a day covering 32 languages including Chinese, Japanese, Korean and Russian.

EPO: a predictable approach to patenting software

An understanding of "technicality" and CII procedures is vital

- Interdisciplinary technical divisions of three examiners for each application

- Annual improvements to the CII content of the Guidelines for Examination

- Focus on CII training throughout the entire EOP operational area

- The European Patent Convention is an island of certainty
Software and patents in Europe

- European Patent Convention: computer programs cannot be patented "as such"

- EPO's "Two hurdles" approach to computer implemented inventions:
  - Technical Character
  - Inventive step based on technical features only

- CII, not software as such

Relevant fields – Core/Applied AI

Core AI
- Algorithms/Models, Architectures and Implementations thereof: Hardware (digital/analog), Software, mixed, ...

Applied AI
- Image processing
- Speech processing
- Natural Language Processing
- Control
- Medical Diagnosis
- Fault detection
- Protein sequence prediction
- ...

Multidisciplinary patent applications require searching across fields
Relevant fields – Core/Applied AI – Classes

Core AI – G06N
- Algorithms/Models, Architectures and Implementations thereof: Hardware (digital/analog), Software, mixed, ...

Applied AI
- Pattern recognition G06K9
- Image processing G06T
- Speech processing G10L
- Natural Language Processing G06F17/20
- Control G05B
- Medical Diagnosis A61B5
- ...

Some applications (of AI) are considered non-technical!

Case law of the BoA:
Some purposes are not per se considered as technical

Applied AI
- Natural language processing: "linguistic" problems, semantic features ...
- "Business methods"
- Information retrieval: classification of unstructured text documents
Two dimensions to contribute to technical character

Do(es) the AI and ML Method (steps) contribute to the Technical Character of the Invention?

Two dimensions:

- By being adapted to a specific technical implementation
- By its application to a field of technology

Proactive in search and examination

**Search**

- AI: Often mathematical/algorithmic features!
- CII approach for mixed-type inventions (GL G-VII, 5.4)
- Which features are or are not considered technical
- Which need to be considered in combination!

**Examination**

- Constructive approach with suggestions on clarity issues
- and on how to step over the 1st and 2nd hurdles
- (Fall back positions in view of two dimensions!)
- already in the search opinion!
Proactive in search and examination

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Thank you for your attention!

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