IP Protection of AI Technology

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BG BACHMANN LAW GROUP

Presented by:

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Agenda

- AI Overview
- IP 101
- Trends in AI Patent Activity
- Issues in AI Patentability
- International Patentability of AI
- Whether and When to file for AI patent protection
- Questions

AI Overview

- Artificial Intelligence (AI) definition:

  - The simulation of intelligent human behavior by a machine

    - Action by or interactions with a machine that make it seem it's a person

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  - **A marketing catch phrase**

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  - **Computer Vision**

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  - **Computer Vision**
  - **Natural Language Processing**

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  - **Computer Vision**
  - **Natural Language Processing**
  - **Deep learning**

IP 101

- Types of Intellectual Property

1	Patents
2	Trademarks
3	Copyrights
4	Trade Secrets

IP 101 – Patents

- A government granted right to

  - prevent others

  - from making, using, selling, importing

  - an invention

  - for a set period of time.

- Granted in exchange for full public disclosure of how to make and use the invention.

- Intent is to provide a limited monopoly for a set period of time.

IP 101 – Patents

- Must be novel and nonobvious over the prior art.

- The invention is described in the detailed description and drawings.

- What others can be excluded from is described in the claims.

- Patents can cover utility or design of an invention.

- Provisional or non-provisional patents.

IP 101 – Trademarks

- Trademark protection
  - Protects a name associated with a particular product or service.
  - Mark may be a name, symbol.
  - Mark must be distinctive.
  - Mark must be used in interstate commerce.
  - Protection obtained by use and
    filing mark registration with USPTO.

IP 101 – Copyright

- Copyright protection
    - Protects from reproduction, derivation, distribution.
    - Standard clause (standard code) is not protectable.
    - Protects original code, not independently created code.
    - Created automatically with authorship,
      best to register with Copyright Office.

Trends in AI Patenting

- Technology companies are investing in Artificial Intelligence

  - Annual worldwide AI revenue to increase: $643M (2016) to $38.8B (2025)[1]

1- "Artificial Intelligence Market Forecast," Tractica

Trends in AI Patenting

- AI Investment and Implementation

  - US and China: 50% of AI patent filings

  - Japan, Korea, South Korea, Germany, Canada, UK, Australia, India, Russia
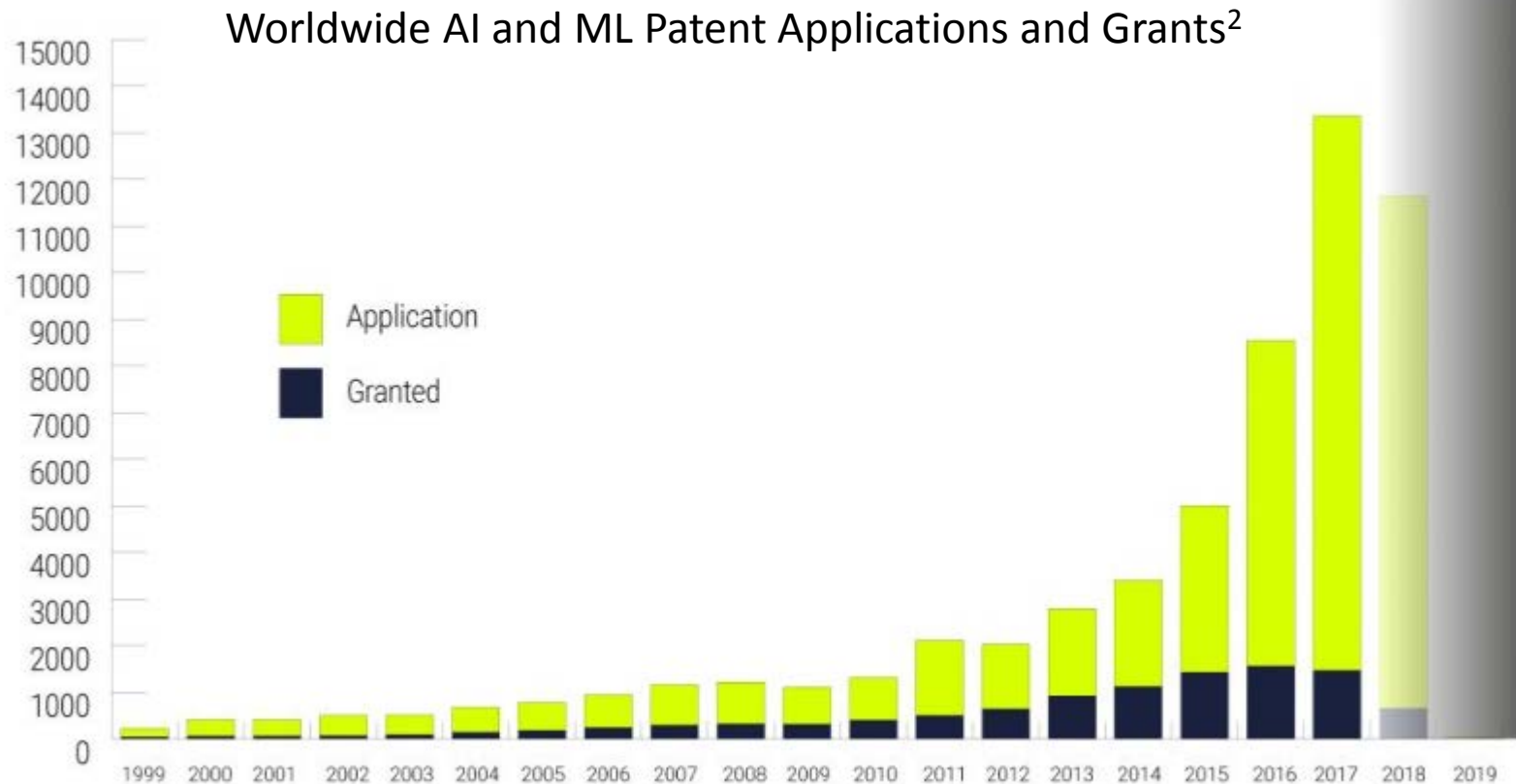
Trends in AI Patenting

- AI Investment and Implementation

    - US and China: 50% of AI patent filings

    - Japan, Korea, South Korea, Germany, Canada, UK, Australia, India, Russia

    - US – NLP and machine learning learning, machine vision

   - China – deep learning, machine vision

Trends in AI Patenting

Worldwide AI and ML Patent Applications and Grants[2]

2-"Patent Filing Trends for AI and ML innovations," ClearViewIP,
https://www.clearviewip.com/reports/patent-filing-trends-for-ai-and-ml-innovations/

Trends in AI Patenting

Patent Publications by Year: Top Assignees[2]

Legend:
- MICROSOFT TECH LICENSING
- IBM
- BAIDU
- GOOGLE
- FACEBOOK

2-"Patent Filing Trends for AI and ML innovations," ClearViewIP,
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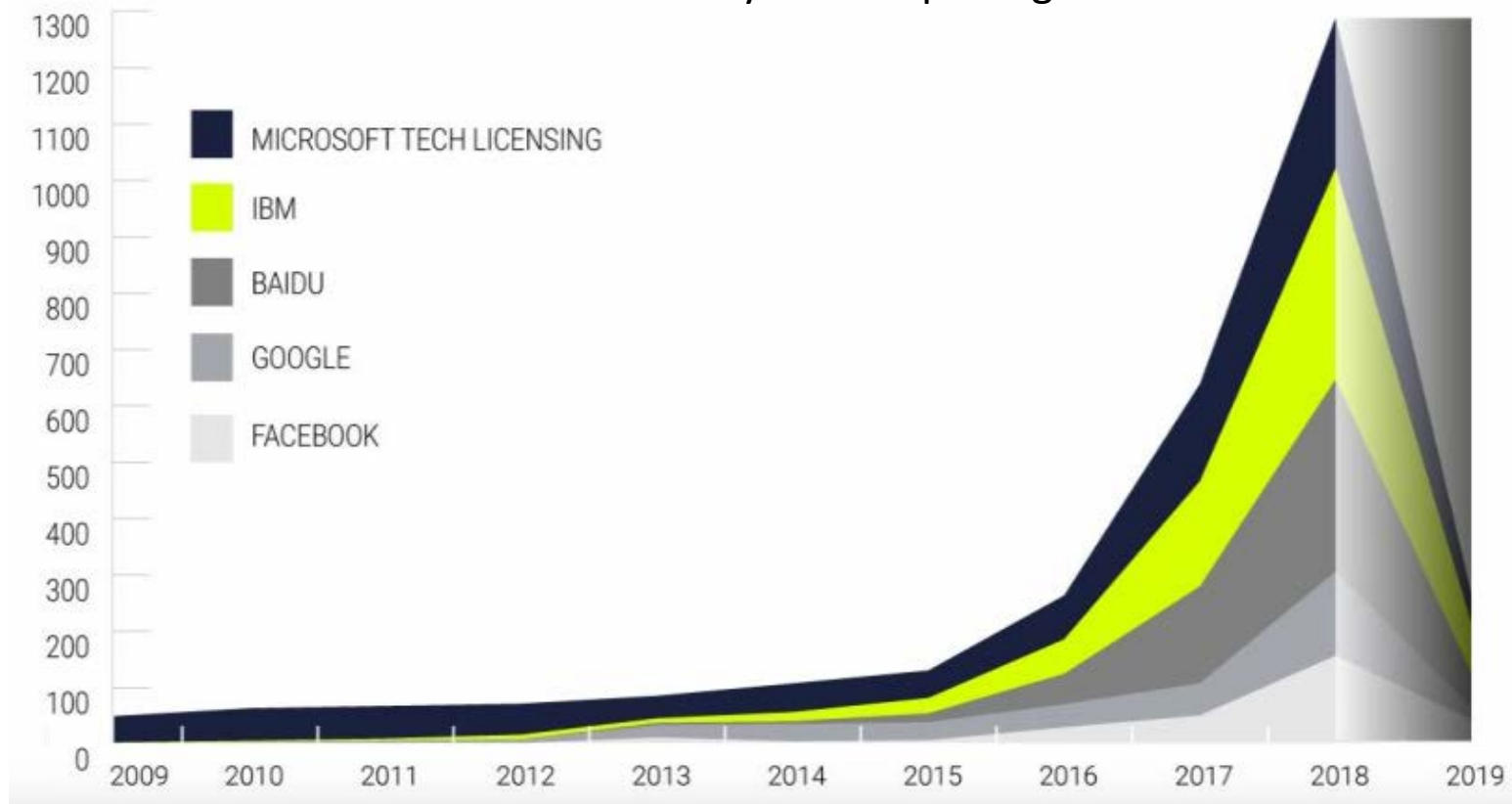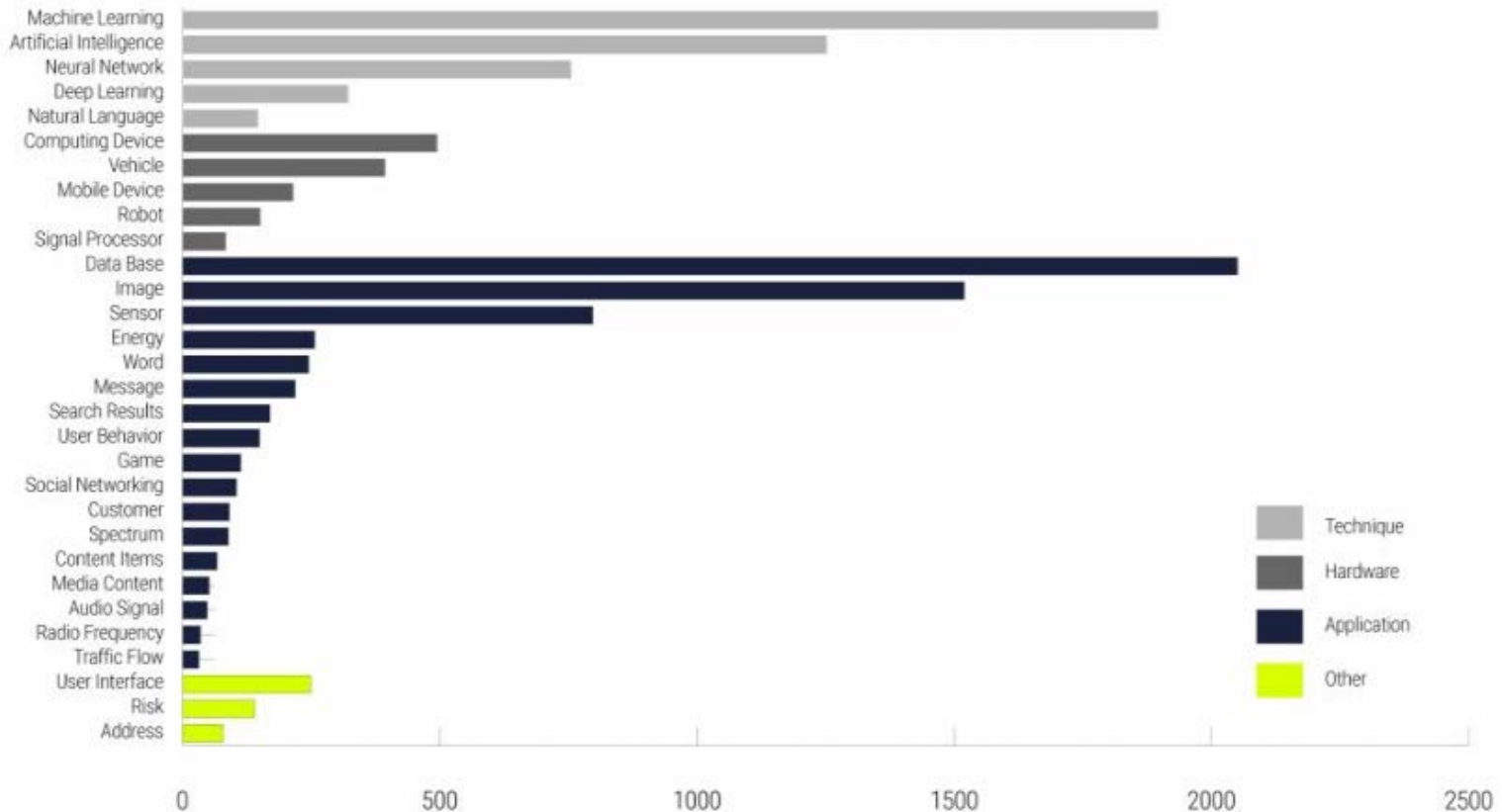
Trends in AI Patenting

Key Terminology in AI and ML Patents[2]

2-"Patent Filing Trends for AI and ML innovations," ClearViewIP,
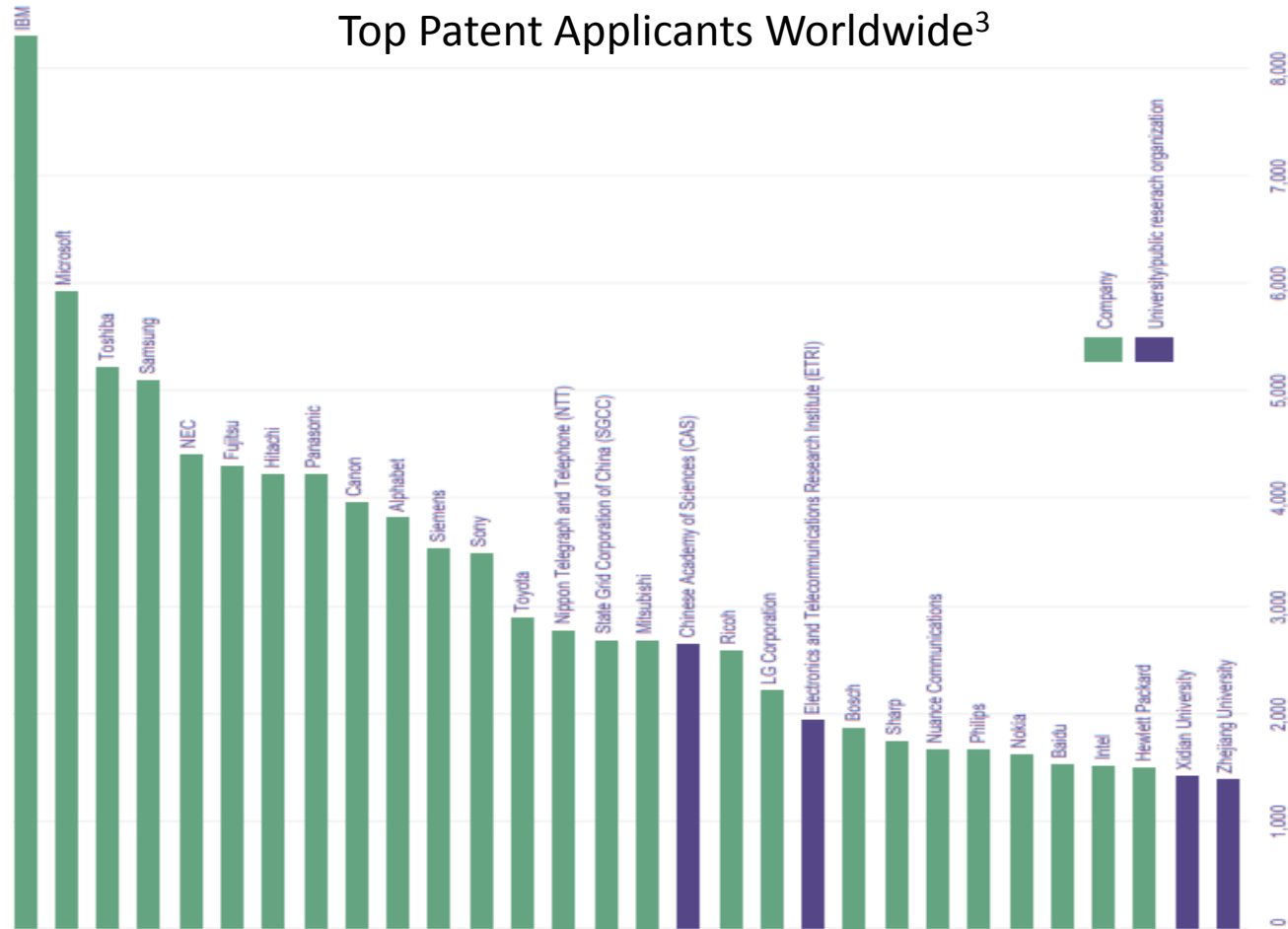https://www.clearviewip.com/reports/patent-filing-trends-for-ai-and-ml-innovations/

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Trends in AI Patenting

Top Patent Applicants Worldwide[3]

3-"Technology Trends 2019:Artificial Intelligence," WIPO

Trends in AI Patenting

AI technology use in Application Fields[3]

	Machine learning	Computer vision	Natural language processing	Speech processing	Control methods	Planning and scheduling	Robotics	Knowledge representation and reasoning	Predictive analytic	Distributed AI
Telecommunications	16,201	22,871	7,553	12,549	3,496	2,801	2,476	1,292	1,533	516
Transportation	13,741	21,744	2,330	3,997	14,030	3,614	5,080	761	866	533
Personal devices, computing and HCI	11,585	17,164	7,920	6,678	1,625	1,663	1,416	1,838	1,069	223
Life and medical sciences	18,772	17,098	3,818	2,504	1,494	1,617	1,988	1,698	1,694	428
Security	8,813	17,235	3,033	3,075	1,162	1,401	793	795	594	243
Document management and publishing	6,841	11,530	9,526	3,291	163	517	221	880	431	83
Business	9,709	7,968	5,850	2,422	271	1,381	350	1,820	2,585	189
Industry and manufacturing	9,569	5,573	3,031	798	1,262	2,404	1,073	1,213	1,086	382
Physical sciences and engineering	8,330	5,397	1,284	1,183	1,540	721	679	444	720	171
Networks	5,296	3,659	2,350	1,498	343	789	380	630	570	183
Arts and humanities	2,489	4,852	2,669	2,615	237	273	371	203	277	44
Education	3,914	3,767	1,642	1,951	284	365	372	532	247	56
Cartography	3,276	3,334	1,610	759	697	697	257	365	425	98
Energy management	3,766	1,056	397	309	734	944	336	187	299	335
Entertainment	1,822	2,890	737	1,087	309	199	528	189	133	41
Computing in government	2,583	2,587	938	444	149	380	135	243	213	71
Banking and finance	2,368	2,047	1,055	493	87	435	99	394	449	81
Agriculture	1,430	1,196	291	126	778	282	415	82	138	48
Military	1,300	1,343	370	269	443	241	255	110	111	73
Law, social and behavioral sciences	780	404	550	121	25	153	37	123	65	23

3-"Technology Trends 2019:Artificial Intelligence," WIPO

Issues in AI Patentability

- Inventorship
  - who conceived of the claimed invention

- Subject Matter Eligibility
  - Something that can be patented

Issues in AI Patentability - Inventorship

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  - An Inventor is an "individual"

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Issues in AI Patentability - Inventorship

- USPTO – Inventor Duties, Requirements, Rights
  - Sign Oath
    - Invention is described
    - First inventor or joint inventor
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  - Can a **machine** make an oath, or sign an Assignment?

Issues in AI Patentability - Inventorship

- Inventorship – The Takeaway.

    - For now, an inventor probably needs to be a live person.

    - A technological innovation generated by a machine is probably not patentable.

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- Inventorship – The Takeaway.

  - For now, an inventor probably needs to be a live person.

  - A technological innovation generated by a machine is probably not patentable.

  - **AI Inventorship issue has not been addressed by statute or courts, but likely will be in the next few years.**

Issues in AI Patentability - SME

- Key requirements for patentability of an invention in the US:
  - Novelty (35 USC 102)
    - invention must be **new**.
  - Non-Obviousness (35 USC 103) – invention
    - Invention must not be **obvious** in light of prior art by person of ordinary skill in the art.
  - Patentable Subject Matter (35 USC 101)
    - Invention must be a new and useful **process, machine, manufacture, or composition of matter**, or any new and useful improvement thereof.

Issues in AI Patentability - SME

- Patentable Subject Matter – judicial exclusions
  - Laws of nature
  - Natural phenomena
  - Mathematical formula
  - Abstract ideas

Issues in AI Patentability - SME

- Supreme Court case – "Alice Corp vs. CLS Bank Int'l"
- Provided 2-part test to determine whether software is directed to an abstract idea:
  - Claims directed towards a judicial exception?
  - If so, do claim elements transform nature of claim into a patent-eligible application?
    - Claim elements amount to "significantly more" than abstract idea?

Issues in AI Patentability - SME

- AI software is patentable SM if it meets one of the following conditions (provides "significantly more"):

1	Rooted in computer technology –DDR Holdings v. Hotels.com
2	Improves computer operation –Enfish, LLC v. Microsoft, Inc.
3	Non-conventional arrangement of known pieces –Bascom Global Internet v. AT&T Mobility LLC
4	Automated process differs from prior process –McRo v. Bondai Namco Games America

Issues in AI Patentability - SME

- Subject Matter Eligibility – The Takeaway.

    - AI related software is potentially patentable if the patent application claims recite significantly more than an abstract idea.

Issues in AI Patentability - SME

- Subject Matter Eligibility – The Takeaway.

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  - **New legislation for software subject matter eligibility is currently being discussed and debated. Changes are likely within 1-2 years.**
    - **Typical software patent application examination delay is 18-24 months from filing.**

International Patentability of AI

- EPO - Subject Matter Eligibility

  - EPO – Guidelines for Patentability, November 1, 2018

    - EPO inventions must overcome two hurdles:
      1) Eligibility hurdle – technical character
      2) Patentability hurdle – claimed SM contributes technical solution to technical problem

    - AI and ML are computational models, "abstract mathematical nature"
    - Mathematical models not patentable

International Patentability of AI

- EPO - Subject Matter Eligibility

  - EPO – Guidelines for Patentability, November 1, 2018

    - EPO examiners to look for AI and ML buzzwords to reject claims
      - "neural networks," "reasoning machine," "support vector machine"

International Patentability of AI

- EPO - Subject Matter Eligibility

  - EPO – Guidelines for Patentability, November 1, 2018

    - EPO AI application claims can be patentable if underlying algorithm or computation model "contains causal link to a technical purpose."

    - Example – "using neural network *in heart monitoring apparatus* in order to *ID irregular heartbeats*."

International Patentability of AI

- Other Countries - Subject Matter Eligibility

    - China – CNIPA has indicated that subject matter eligibility of software is determined with respect to technical solution
        - (similar to EPO)

    - Japan – JPO stance on software SM eligibility is similar to USPTO.

International AI Copyright

- Copyright

  - Copyright is granted to creator of an original work.

  - US – copyright not granted for art produced by machine "without any creative input or intervention from a human author."

  - EU – copyright cannot be granted to computer, must be human

AI Patent Strategy

AI Patent Strategy

- Describe and Claim Technical Solutions

  - In the specification, include a paragraph or two about the **technical problem**, the **technical field**, and a summary of the **technical solution** of the AI based invention
  - Recite more than one example or angle of the technical problem – don't limit to a single problem
    - "At least one of the technical problems that the present technology solves is…"
    - "The present technology provides a technical solution to several technical problems, including but not limited to…"

AI Patent Strategy

- Describe and Claim Improvements to Computer Technology

  - In the specification, include a paragraph or two about the **computer technology**, and a summary of the **technical improvement** to the computer technology
  - Improves speed or processing or providing result, less processing, better efficiency, **better performance metric**

AI Patent Strategy

- Terms and Buzzwords

  - **Do not** overly rely on buzzwords, especially in the claims, such as neural networks, reasoning engine, support vector machine
    - Especially if foreign filing! ("pattern recognizing machine")
  - **Do** use technical terminology in specification and claims, such as data signal, data structure, database, communication interface, network protocol, encoding, modulation, server
  - **Do** recite interactions with hardware, data associations (e.g., control data)

AI Patent Strategy

- Focus on patentable AI system elements that the inventors conceived:

  - **Input data preparation**
  - **Model structure/modification**
  - **Training phase process**
  - **Output data post-processing**
  - **AI/ML-based hardware and/or Architecture**

AI Patent Strategy

- Describe entire AI System, including use of output

  - Data training phase, model structure, placement of model in larger system that utilizes model output to perform xxx….
  - Pre-processing of training data
  - Use of trained classifiers, sequence of classifier use
  - End-to-end workflow description
  - Hardware that provides input to / receives and uses output of AI system

Filing for AI patents - why

Why patents are useful

- Attract Investment

- Prevent theft of Innovations

- Avoid Litigation

Filing for AI patents - why

Companies that have filed for and obtained approved patents are more likely to be successful.

- Employment growth of 36% over 5 years.
- Sales growth increase of 51%.
- Increased likelihood to secure VC funding over next 3 years
- Doubled likelihood that company is eventually listed on stock exchange

-"The Bright Side of Patents," Joan Farre-Mensa, Harvard Business School, Deepak Hedgde and Alexander Ljungqvist of NYU Stern School of Business, February 2016, NBER Working Paper No. 21959

Filing for AI patents – why not

- Reasons to <u>not</u> obtain patent protection, but to consider Trade Secret protection:

    - Infringement **difficult to detect**.
    - Copying/reverse engineering **difficult to achieve**.
    - Innovation **obsolete before patent** obtained.
    - Innovation value **outlasts** granted patent rights.
    - Innovation is **not patentable**
    - Innovation **not aligned** with business goals

Filing for AI patents - when

A company should consider obtaining patent protection:

- 2-3 months before trying to obtain VC funding

- Before disclosing technology or contracting with third parties

- When company success takes away or is on track to take away competitor market share in the next 1-2 years

Filing for AI patents - what

	Less Valuable	Fairly Valuable	Very Valuable
Unlikely patentable	Open Source / Do not consider for patent protection	Trade Secret / Do not consider for patent protection	Trade Secret
Fairly likely patentable	Do not consider for patent protection	Low priority patent protection	Normal priority patent protection
Very likely patentable	Low priority patent protection	Normal priority patent protection	High priority patent protection

Questions

The End.

Thank You

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