

Beyond the hype



# Navigating IP in Artificial Intelligence and Data Sciences

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# Why bother?

“Open-source the technology, the value is in the data”

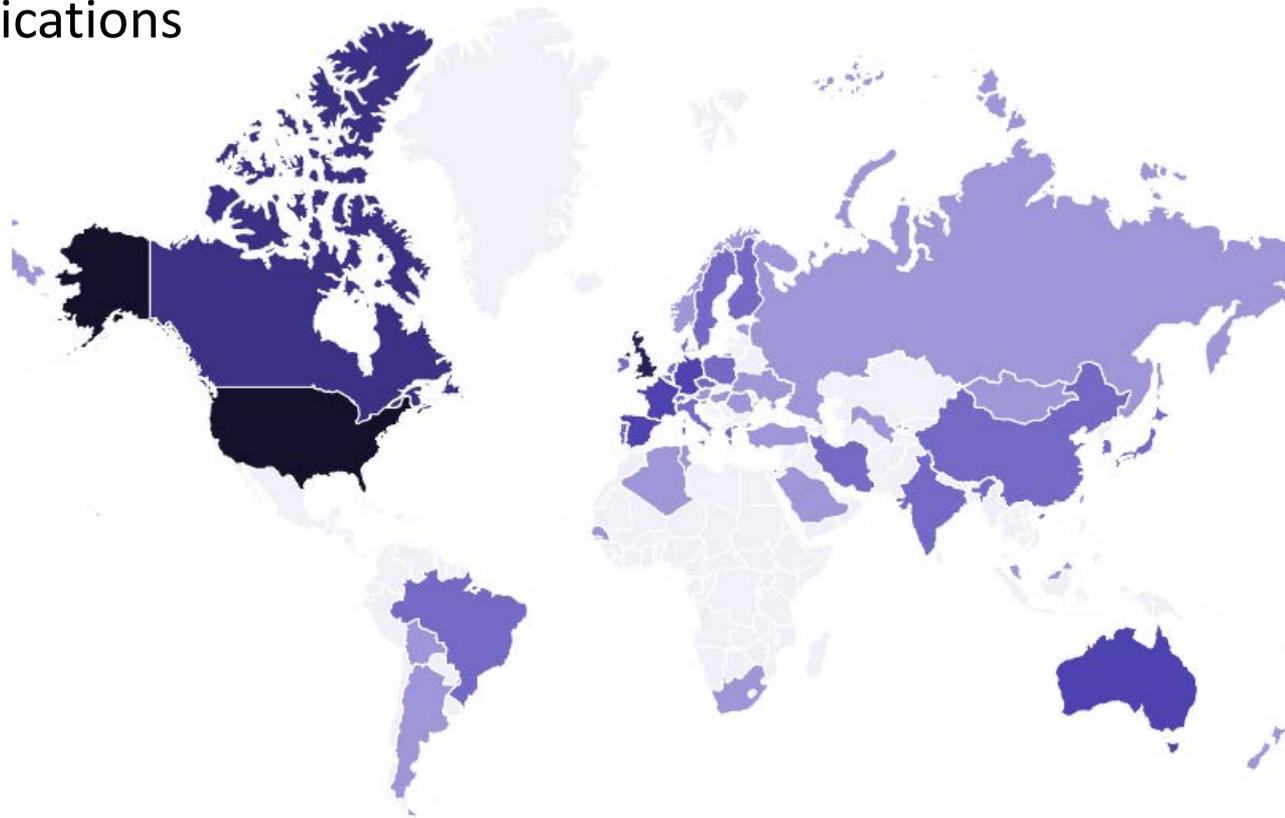
-- Anonymous

“For every difficult and complicated question there is an answer that is simple, easily understood and wrong”

-- H. L. Mencken

# Global AI Talent 2018

Roughly 22,000 PhD-educated researchers capable of working in AI research and applications



Total AI Talent

No data 0-100 100-500 500-1k 1k-1.5k 1.5k-2k 9k+

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Source: <http://www.jfgagne.ai/talent/>

# Intellectual Assets = Talent + IPRs

- Intellectual Property (IP) Rights
  - Capture and provide legal control over creations
  - IPRs govern proprietary and open-source approaches
- IP Rights in the context of Machine Learning (ML)
  - IP Rights re Data
  - IP Rights re Algorithm, Software and Their Uses

# IP Rights - Data

## The business questions:

- Where did we get the data?
  - Crude state? Refined state?
- What can we do with the data?
  - Is it clearly set forth in an agreement?
  - How do you integrate existing (GDPR) and future data regulations?
- How will we control ownership of the analytics?
  - Shall we be a data creator? Data curator? Data owner?

# IP Rights - Data

## The IP questions:

- Is there copyright in the raw data?
  - What about an original selection or arrangement?
- What rights in the databases?
- Who owns:
  - The tools used to analyse the data?
  - The analytic reports?
  - The insights gained from the reports?
  - The trained ML model?

# IP Rights – Algorithm, Software and Their Uses

## Freedom To Operate (FTO)

- Respect boundaries of existing IP Rights
  - Patents, copyrights & trade secrets

## Leveraging investments in AI and Data Sciences R&D

- Open-source vs proprietary?
  - Fast adoption, collaboration
  - Building competitive edge in a fast-paced environment

# IP Rights – Algorithm, Software and Their Uses

## Proprietary

- IP Rights = blending copyrights, trade secrets and/or patents
- Lack of IP Rights = defensive publication

# IP Rights – Algorithm, Software and Their Uses

Trade Secrets - typically protect any information, idea, concept that derives its value from secrecy

## Pros:

- Avoid a need for disclosure
- Avoid a need for governmental registration

## Cons:

- Only cause of action is misappropriation
- It is toothpaste out of the tube
  - Bear in mind future regulations addressing algorithm bias
- Examples: set of rules, neural network topologies, data
- Suited for tech with short lifespan or difficult to reverse engineer

# IP Rights – Algorithm, Software and Their Uses

Copyrights – typically protect source code

## Pros:

- Avoid a need for governmental registration
  - Not required, suggested in certain circumstances
- Exclusive legal right to produce, reproduce and publish
  - Core to open-source licenses

## Cons:

- Does not protect underlying inventions embodied by the source code
- Human authorship requirement in the U.S.
  - Monkey Selfie Case - *Naruto v Slater*, 2016 WL 363321 (N.D. California)

# What is patentable?

Detailed

Patentable

## Applications

*Apply AI to solve a specific problem, often without restricting the solution to a specific algorithm*

*EP2377044B1 - Uses of ML algorithm to detect anomalous patterns in video data*

*EP2930578B1 - Method for classifying the cause of machine failure by using ML to analyse features obtained from sensors*

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## Platforms

*Platform from which a problem can be solved, without explicitly restricting the scope of the invention to a specific application area*

*Speech processing, image processing*

*EP2948877B1 – Method for image retrieval based on image segmentation and feature descriptors*

*EP1770612B1 - Method for distributed training of a Support Vector Machine (SVM)*

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## Fundamental Algorithms

*AI and ML algorithms themselves*

*Likely to be considered mathematical methods that are non-inventions - Article 52(2)(3) EPC*

*Likely to qualify as abstract idea as laid out by the U.S. Supreme Court in Alice*

Abstract

Unpatentable

# What does an AI patent look like?

(12) **United States Patent**  
**Sutskever et al.**

(10) **Patent No.:** **US 9,805,028 B1**

(45) **Date of Patent:** **Oct. 31, 2017**

(54) **TRANSLATING TERMS USING NUMERIC REPRESENTATIONS**

(71) Applicant: **Google Inc.**, Mountain View, CA (US)

(72) Inventors: **Ilya Sutskever**, Mountain View, CA (US); **Tomas Mikolov**, Jersey City, NJ (US); **Jeffrey Adgate Dean**, Palo Alto, CA (US); **Quoc V. Le**, Mountain View, CA (US)

(73) Assignee: **Google Inc.**, Mountain View, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 54 days.

(21) Appl. No.: **14/857,709**

(22) Filed: **Sep. 17, 2015**

## Related U.S. Application Data

(56) **References Cited**

### U.S. PATENT DOCUMENTS

4,635,199 A \* 1/1987 Muraki ..... G06F 17/2872  
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### OTHER PUBLICATIONS

Haghighi et al., "Learning Bilingual Lexicons from Monolingual Corpora," (2008) [online] (retrieved from [http://nlp.cs.berkeley.edu/pubs/Haghighi-Liang-BergKirkpatrick-Klein\\_2008\\_Lexicons\\_paper.pdf](http://nlp.cs.berkeley.edu/pubs/Haghighi-Liang-BergKirkpatrick-Klein_2008_Lexicons_paper.pdf)) 9 pages.

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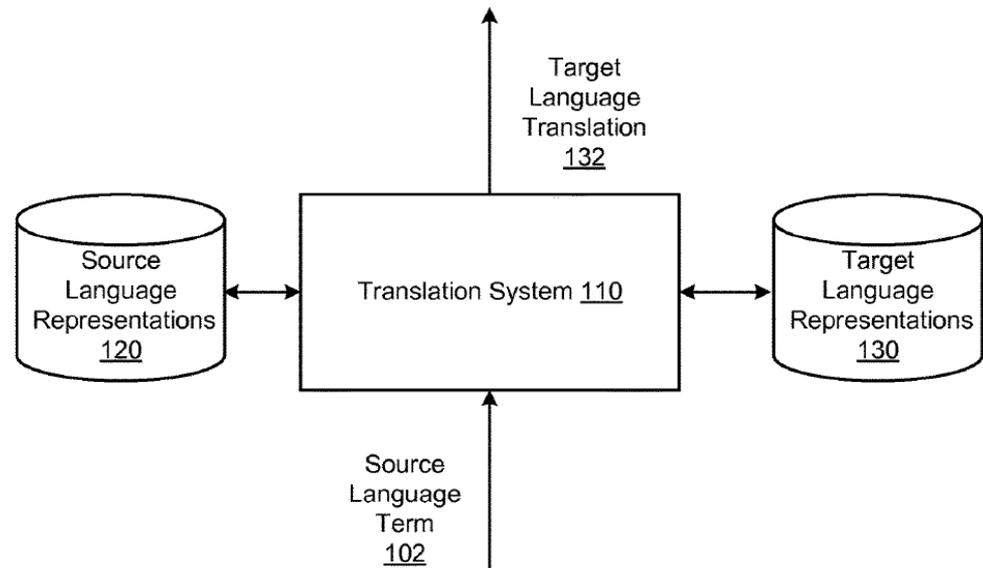
*Assistant Examiner* — David Kovacek

(74) *Attorney, Agent, or Firm* — **Fish & Richardson P.C.**

# What does an AI patent look like?

The invention outlined in the patent application relates to machine translation.

The translation system generates the translation of the terms using high-dimensional representations of the terms in the vocabulary and high-dimensional representations of terms in a vocabulary of terms in the target language.



# What does an AI patent look like?

The scope of protection is defined by the claims, typically reciting a software-implemented method comprising a novel and inventive series of steps:

[...]

identifying a high-dimensional representation of the first language term;

applying a transformation to the high-dimensional representation of the first language term to generate a transformed representation, **wherein applying the transformation to the high-dimensional representation of the first language term comprises applying the transformation in accordance with trained values of a set of parameters, the trained values of the set of parameters having been determined through applying a machine learning training procedure on training terms in the first language and a respective translation of each of the training terms into the second language;**

selecting, from the high-dimensional representations of the terms in the vocabulary of terms in the second language, a closest high-dimensional representation to the transformed representation; and

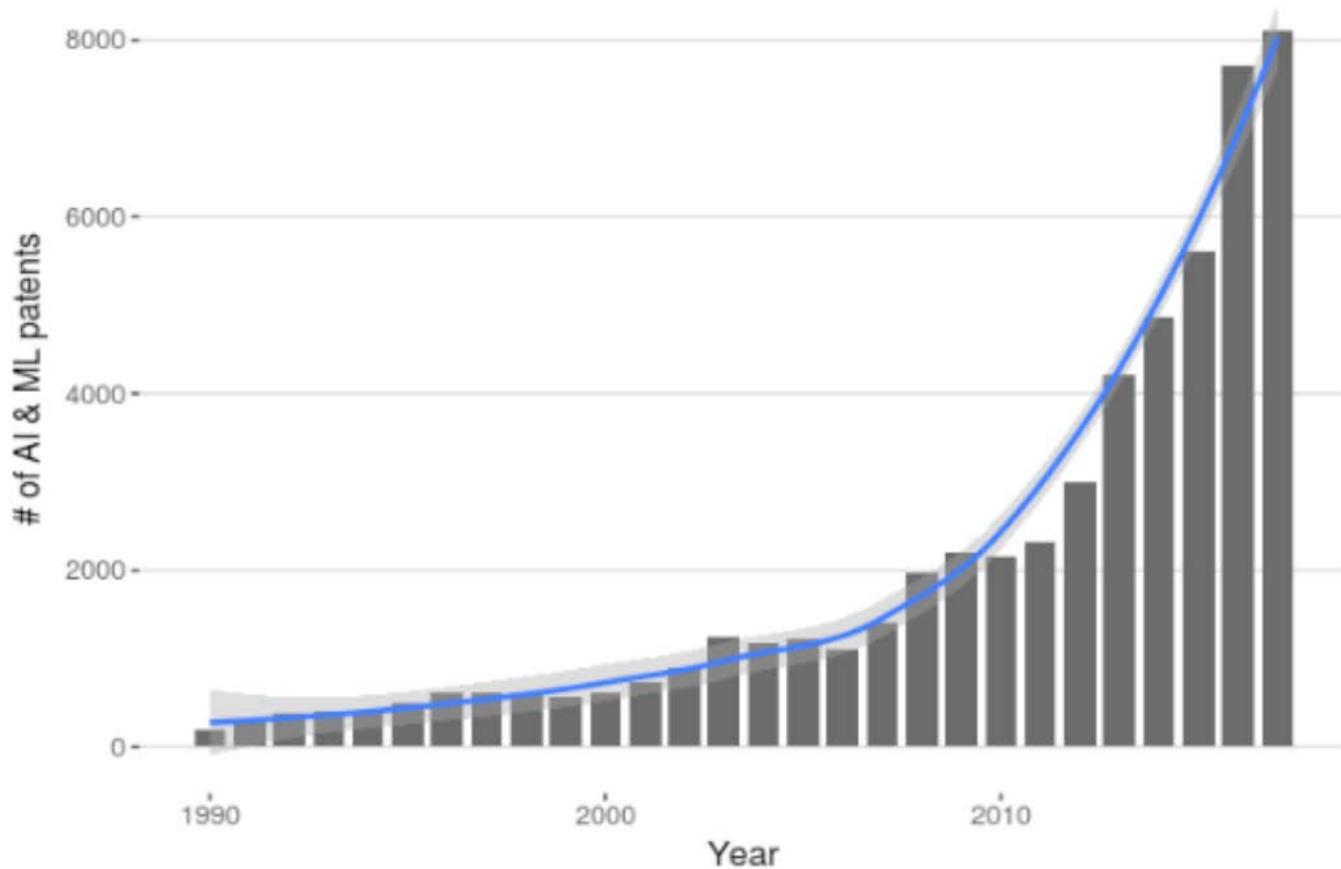
selecting the term in the second language that is associated with the closest high-dimensional representation as the translation into the second language of the first language term.

# What do we often hear about patents?

- ~~Patents suck, we believe in open source~~ \*
  - \* Open source and patents are not mutually exclusive
- Do not feed the patent trolls
  - \* Pure patent trolling is in severe decline
- ~~Software patents are dead~~ \*
  - \* US Federal Circuit and USPTO are cleaning up the mess, EPO is conducting round tables to revise patent eligibility for AI technologies
- It is too expensive
  - True, about 35K\$ for a US Patent
  - Hence the need to be strategic in making such investments

# IP Trends in AI

Evolution of AI & ML patents between 1990-2017

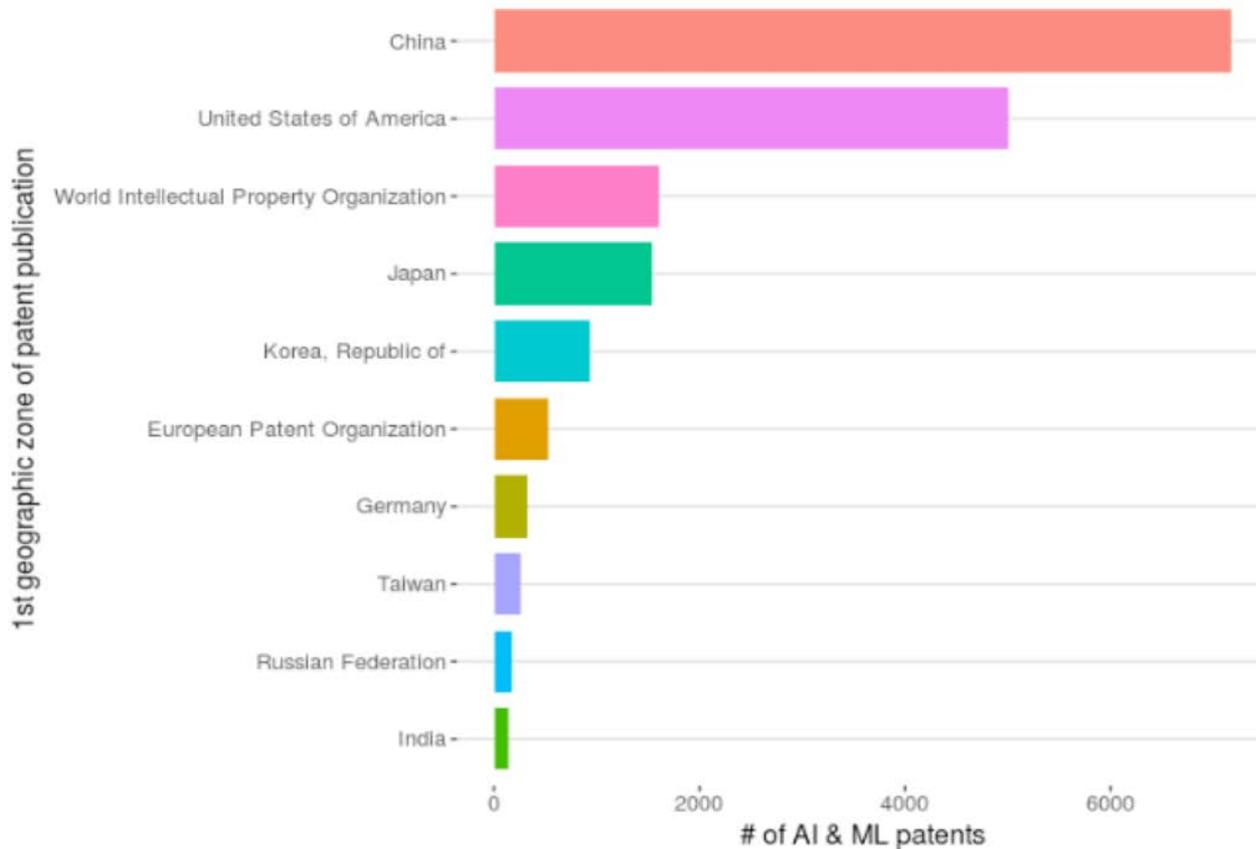


Source: Thierry Warin et al., 2017, Mapping Innovations in Artificial Intelligence Through Patents: A Social Data Science Perspective.

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# IP Trends in AI – Canada, an IP - AI leader?

AI & ML patents by geographical origin



Source: Thierry Warin et al., 2017, Mapping Innovations in Artificial Intelligence Through Patents: A Social Data Science Perspective.

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Smart

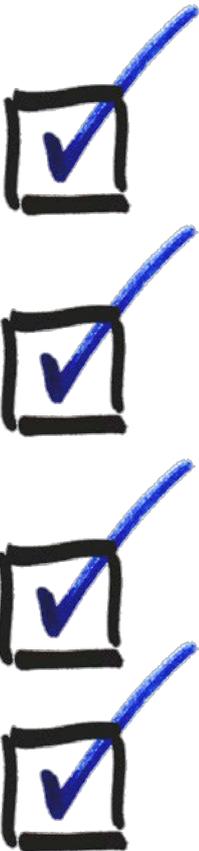
# Why should organizations file patents?

- Clearly establishes who owns what
  - Founders, employees, contractors and partners
- Attract funding, increase valuation
  - Creates valuation premium for strategic buyers (value of control)
- Increase lever in a collaborative context
  - Your IP will be scrutinized by tech giants with whom you are partnering
- Stronger market position
  - Protect margins through reduced competition
  - Deter competitors to sue for infringement

# What do investors/acquirers want to hear?

## Blue sky IP strategy

- Clean chain of title ownership
- Technological features having market value properly protected
- Properly defined and controlled licenses on IP
- Well-shaped and executed FTO(s)



# Tailoring IP Strategies

- 4D Puzzle – Solving it is critical to capture and control value of Canada-created technologies
  - University? Startup? Corporation?
  - Core-AI? Applied-AI?
- Status Quo = draining IP from Canadian AI research labs to US/Chinese tech giants

“We have all the ingredients, we just need the proper recipe”

- Canada’s first national IP strategy announced on April 26, 2018

# THANK YOU!

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