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# Strategies for Patenting Artificial Intelligence

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Consultants' Network of Silicon Valley

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# Agenda

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- IP 101
- Trends in AI Patent Activity
- Patentable aspects of AI Systems
- AI patent strategies
- Why, When, What to file for AI patent protection
- Questions

# IP 101

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- Types of Intellectual Property

1	Patents
2	Trademarks
3	Copyrights
4	Trade Secrets

# IP 101 – Patents

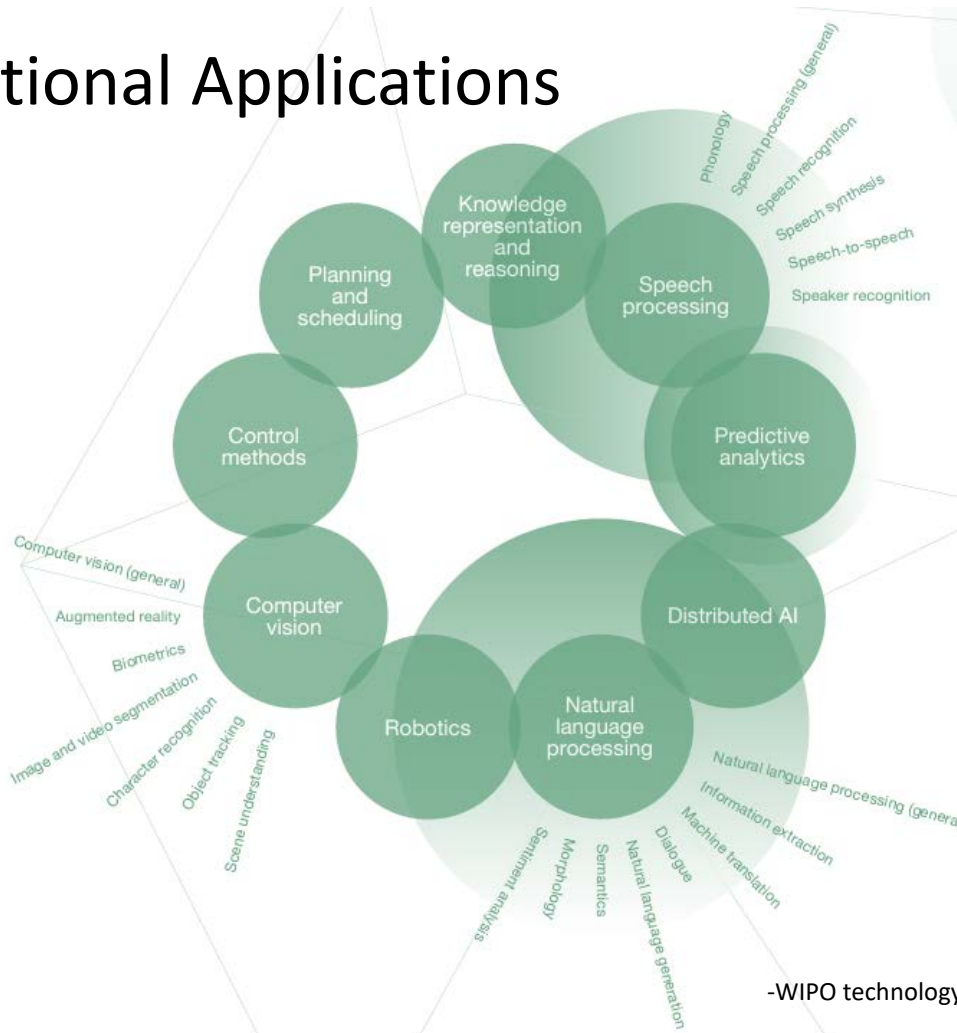
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- Must be novel and nonobvious over the prior art.
- The invention is described in the detailed description and drawings.
- What others can be excluded from is described in the claims.
- Patents can cover utility or design of an invention.
- Provisional or non-provisional patents.



# Trends in AI Patenting

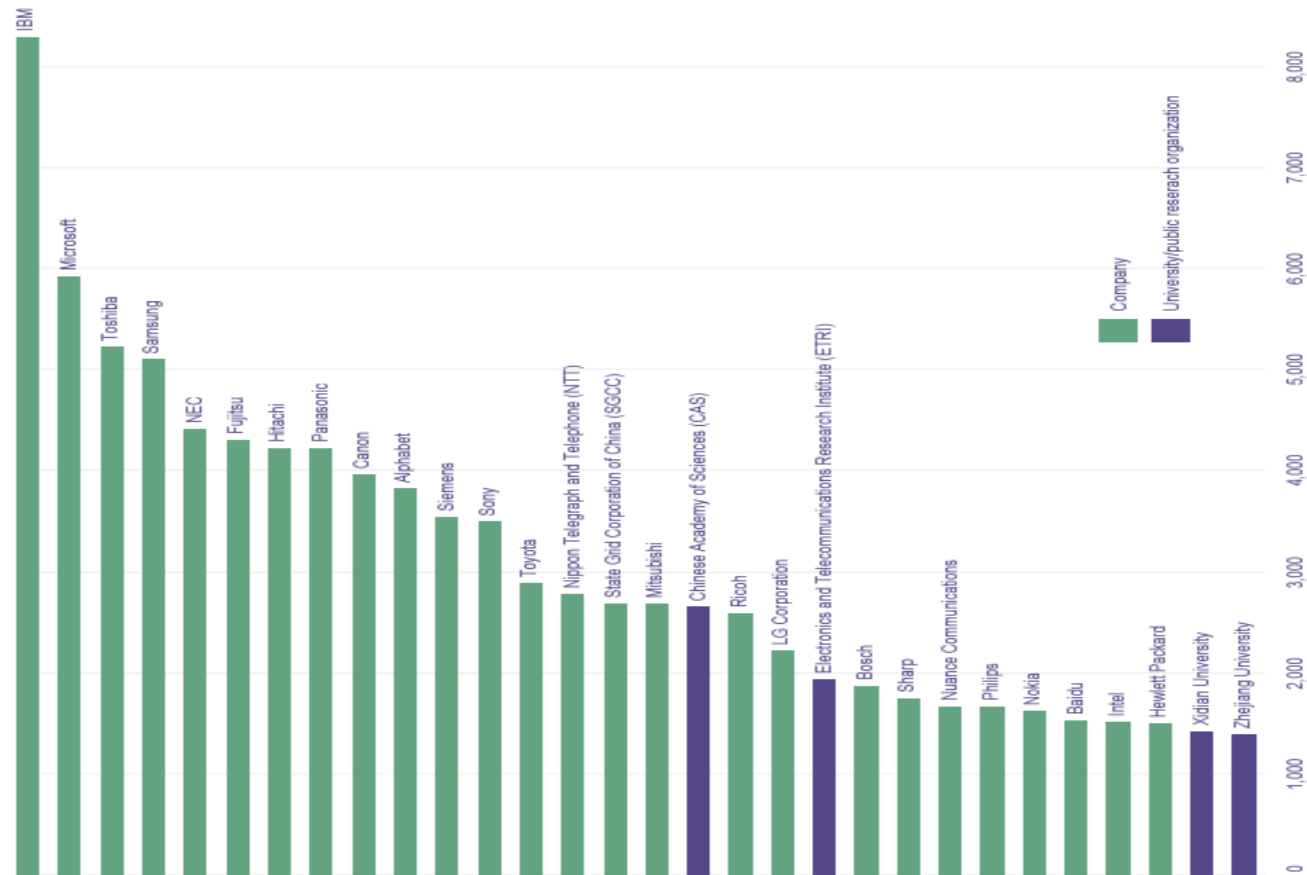
- AI Functional Applications



-WIPO technology Trends on Artificial Intelligence 2019

# Trends in AI Patenting

- Top Applicants for AI patents worldwide

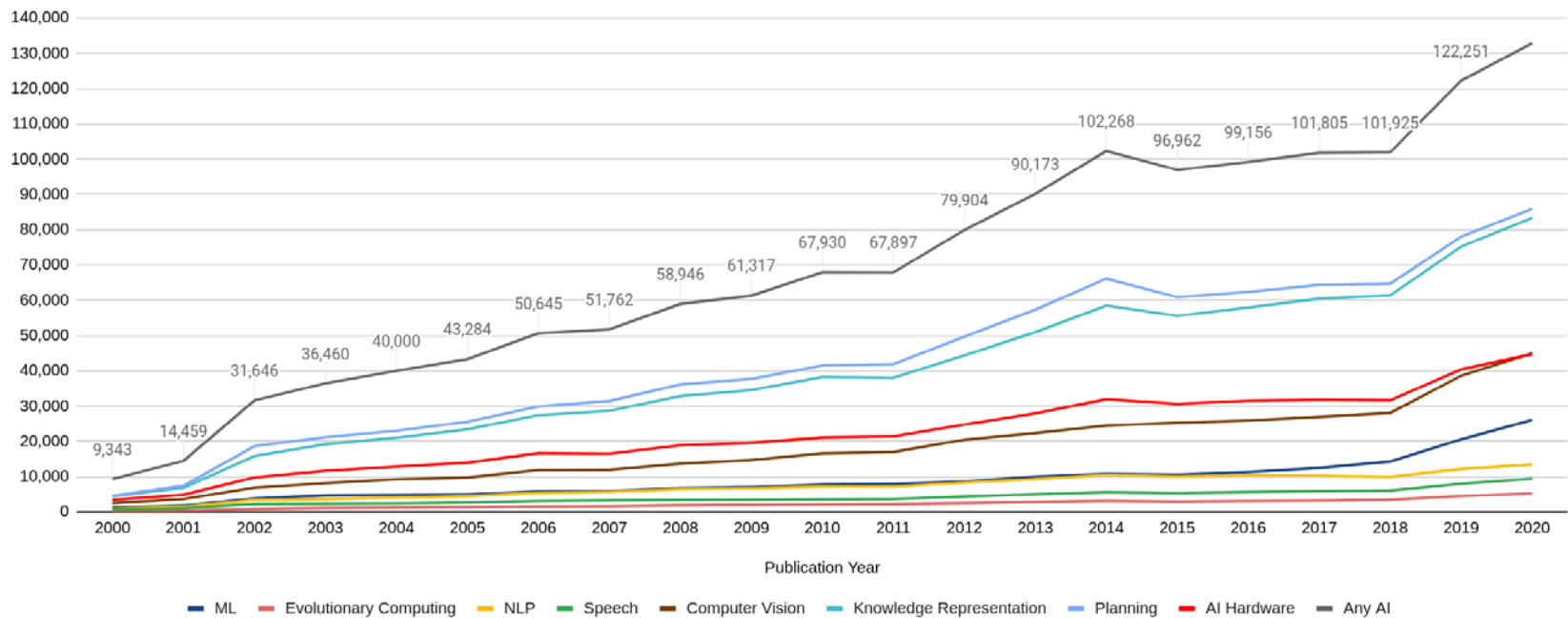


-WIPO technology Trends on Artificial Intelligence 2019

# Trends in AI Patenting

## Patent Publications by Year

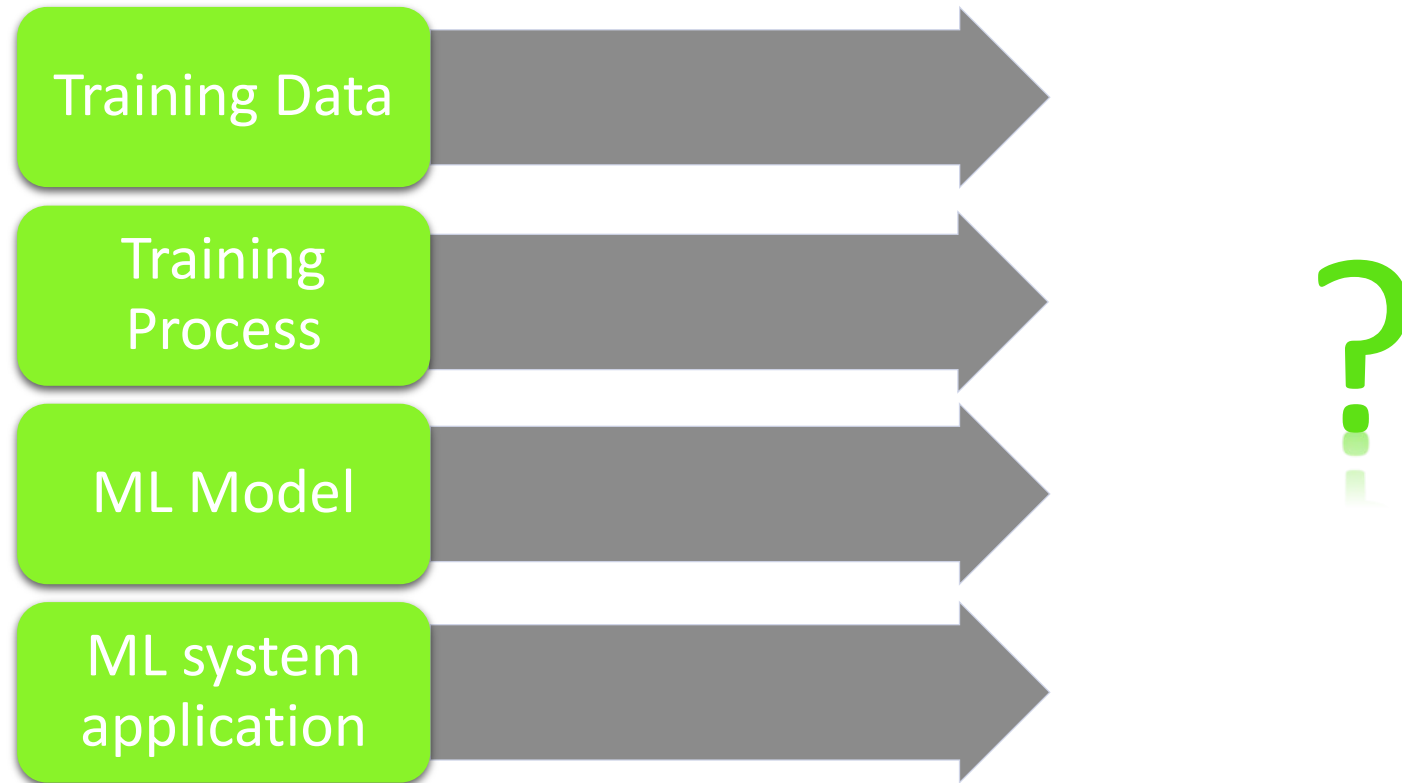
Year vs Number of Publications



-USPTO – The Artificial Intelligence Data Set (AIPD)

# Patentable Aspects of AI

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# Patentable Aspects of AI

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- Training Data
  - The creation and manipulation of training data may be patentable
    - Potentially patentable as a Data Structure
  - Obtaining training data
    - Copyright concerns
    - Fair Use defense

# Patentable Aspects of AI

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- Training Data

- Training data is a VALUABLE asset



- Protect as a Trade Secret



# Patentable Aspects of AI

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- Training Process
  - Model training process has been found patentable
    - Training data for manual process was modified
    - Multiple iterations of training
  - Has been found unpatentable
    - Using existing model with new data

# Patentable Aspects of AI

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- Training Process
  - Consider patenting training process if:
    1. Clear novel aspects to your process
    2. Training process gives known advantage over competitors
    3. The advantage is desired by customers or tied to revenue
  - Note: consider ability to detect infringement of training process methods and innovations

# Patentable Aspects of AI

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- Machine learning model features
  - Novel or modified models can be patentable
    - Modification of parameters, automatic updating of parameters
    - Modified neural networks
    - Stages of models or model nodes used or arranged in a new way



# Patentable Aspects of AI

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- Machine learning model features
  - Novel or modified models can be unpatentable
    - Pure algorithms implemented by models
    - Models used with new data
    - Using generic models in a known process



# Patentable Aspects of AI

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- Machine learning system
  - ML system that generates an output is potentially patentable subject matter
    - System receives input, processes input, generates output
    - Requires novelty over existing ML system
    - Protection of entire system can help patentability of novel aspect considered on its own

# Patentable Aspects of AI

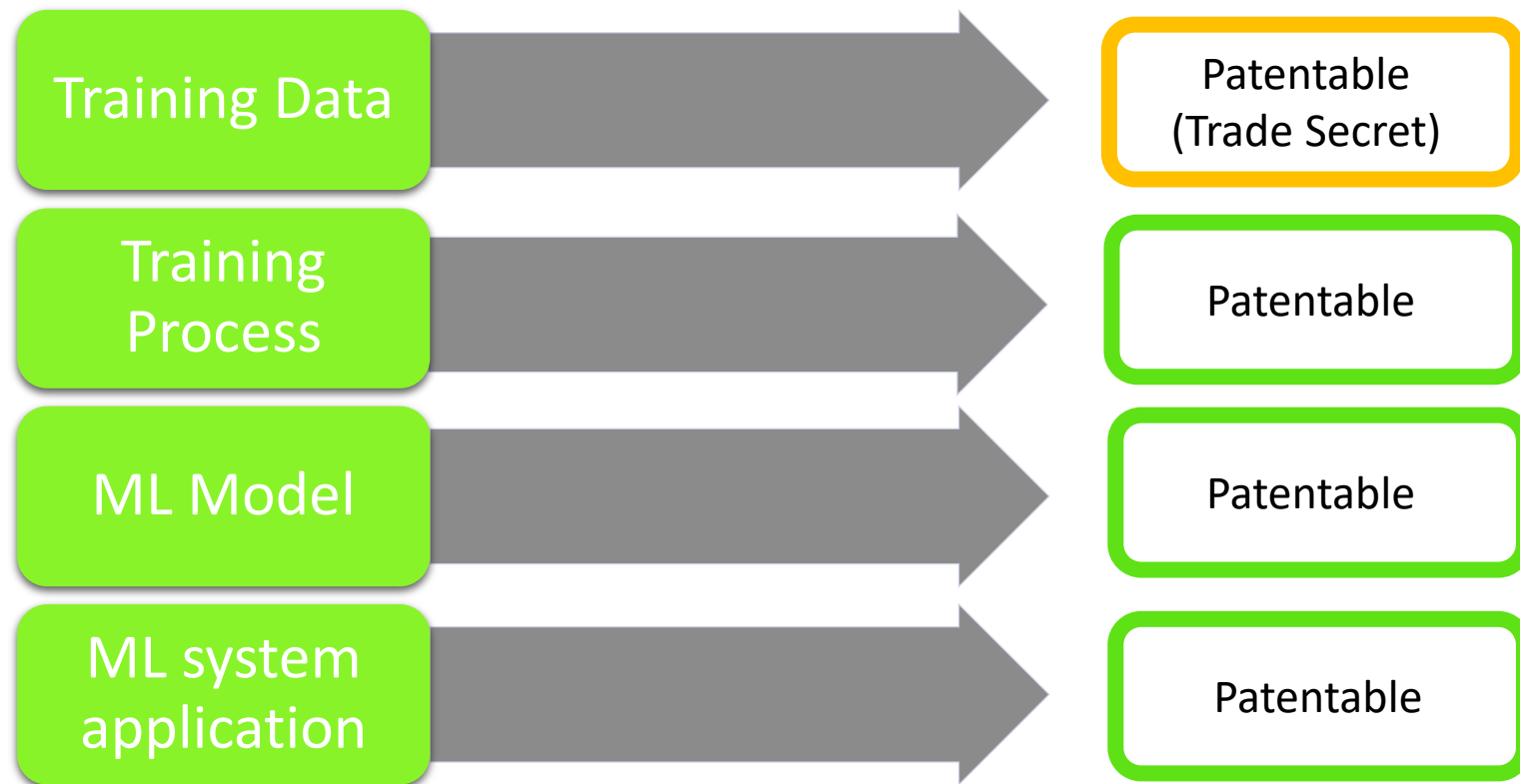
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- Machine learning system application
  - Applications of the model output can strengthen invention patentability
    - Use of model output by a larger system
    - Labeling of an image
    - Automatically performing actions based on model output



# Patentable Aspects of AI

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# AI Patent Strategy

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- AI patentability



Software patentability

- Software is deemed patentable subject matter as long as it is deemed not abstract:
  - Not a pure algorithm
  - Innovation is directed to something technical in nature

# AI Patent Strategy

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- AI software is patentable SM if it meets one of the following conditions:

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

# AI Patent Strategy

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- 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

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- 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

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- 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

# AI Patent Strategy

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- Terms and Buzzwords
  - **Do not** overly rely on buzzwords, especially in the claims, such as neural networks, reasoning engine, support vector machine, machine learning engine
    - 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, weights, classifiers
  - **Do** recite interactions with hardware, data associations (e.g., control data)

# AI Patent Strategy

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- Focus and describe 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

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- Focus and describe patentable AI system STRUCTURE that the inventors conceived:
  - Input structure
    - Machine inputs, scanners, sensors
    - Automatic, event triggered
    - Novel or strategic positioning
  - Receiving and Storage
    - Local vs cloud, automated, complicated storage arrays
  - Output structure
    - Output processing systems
    - Automatic, further processed

# AI Patent Strategy

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- To obtain AI system protection, AVOID:
  - Generic language in claims
    - Machine learning model
    - Terms for collecting and analyzing information
  - Description of applying generic machine learning to a known process

# Filing for AI patents - why

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## Why patents are useful

- Attract Investment
- Prevent theft of Innovations
- Avoid Litigation



# Filing for AI patents - why

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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

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- Reasons to not 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

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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

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	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

# Filing for AI patents - how

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To obtain a patent(s), have a PLAN:

- Determine IP goals and budget
- Identify and prioritize innovations
- Draft and file detailed, technical patent applications that follow your plan using guidelines suggested





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# Thank You

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