Bennett Jones

100

11th Annual University of Toronto Patent Colloquium

AI's Impact on Patent Law – Can AI Be the Inventor?

Moderator: Emily Kettel,
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Panellists:
Jordana Sanft, Lenczner Slaght LLP
Gervas Wall, Deeth Williams Wall LLP
Brian Chau, Norton Rose Fulbright

Topics

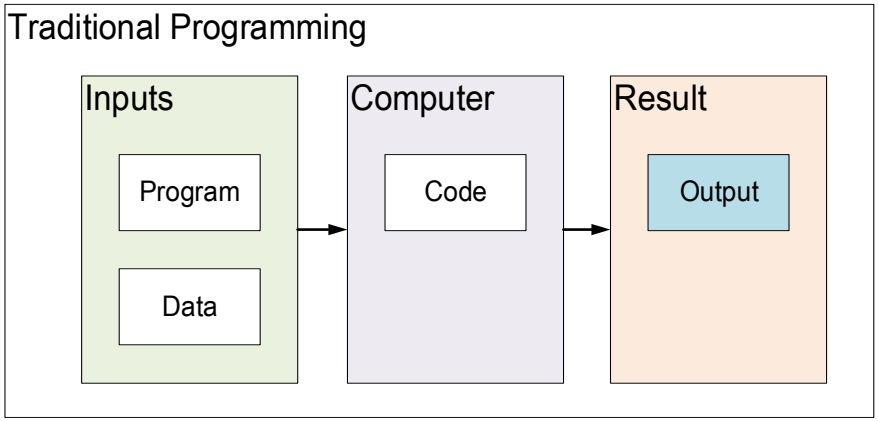
- What is AI?
- AI ownership and inventorship in the context of the *Patent Act*
- DABUS: AI patent applications worldwide
- How will AI change the patent bargain?
- How is the state of the art changing with AI?
- How could AI-invented patents increase risk from patent assertion entities?
- Patent (inventor) vs copyright (author)
- Questions and comments

NORTON ROSE FULBRIGHT

DABUS
Technical Discussion
Last Updated: 2022-10

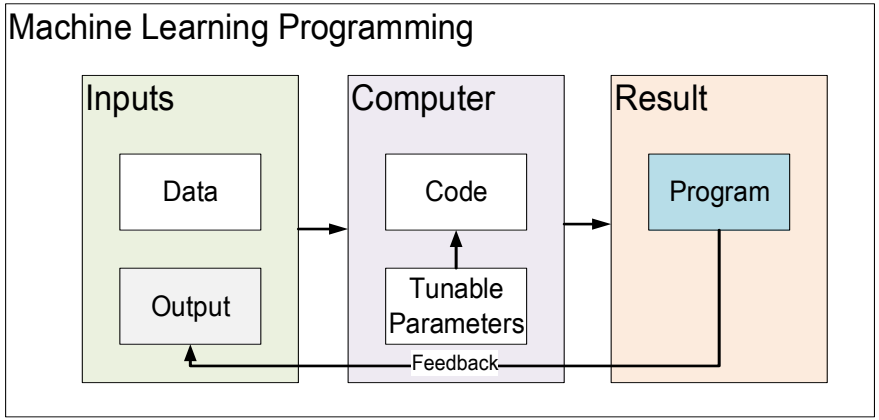
Norton Rose Fulbright
Patent Colloquium
Brian Chau

AI / Machine Learning Basics



$y = H(x)$

Programmer defines H(x)



$y = H(x,\Theta)$

Programmer intializes $H(x, \Theta_0)$

trains parameters Θ

applies trained $H(x, \Theta)$

Machine learning is directed to an indirect approach to programming, where the program is not explicitly defined.

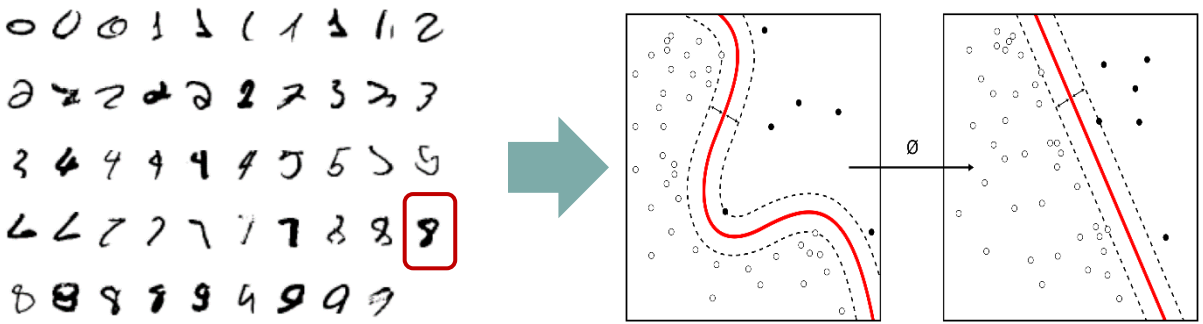
Rather, the program "learns" by adjusting internal mechnanisms (e.g., weighted interconnections).

Very useful tool for solving highly non-linear problems (e.g., machine vision, translation) where there is data available.

A drawback is it that it can be difficult to explain / understand what the trained hypothesis / latent space looks like.

AI / Machine Learning Basics

Typically, they have been used in scenarios where **humans** define the problem, train a model, and then **deploy the trained model as a tool**.



Program: f(x1, x2, x3) = Ax^3 + Bx^2 + Cx + D (simplified)
Output: For an input (x1, x2, x3); f(x1, x2, x3)
isEIGHT = 0.75

-> Since isEIGHT > 0.5, isEIGHT = TRUE.

There are different types of machine learning:

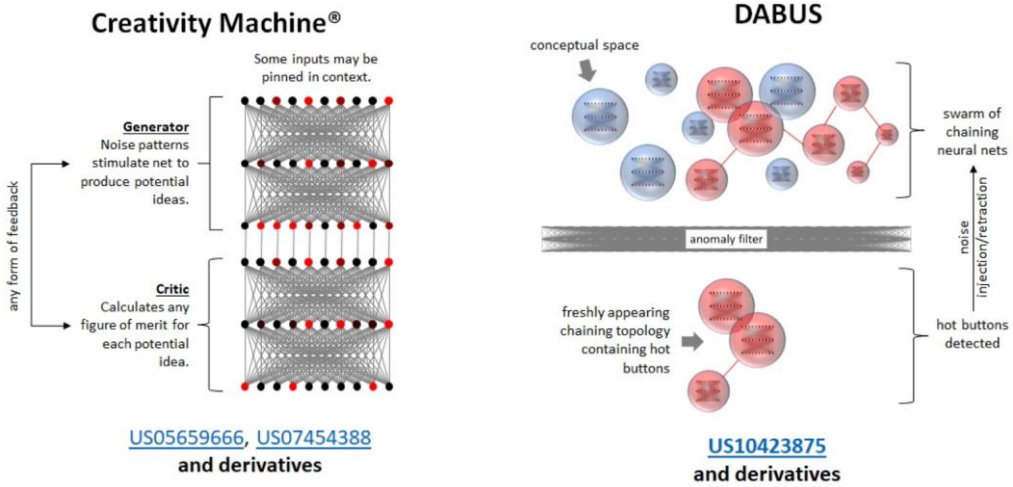
- supervised learning
- unsupervised learning
- reinforcement learning

Image Credit (Wikipedia): By Original: Alisneaky Vector: Zirguezi - Own work based on: Kernel Machine.png, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=47868867

Image Credit: "THE MNIST DATABASE of handwritten digits". Yann LeCun, Courant Institute, NYU Corinna Cortes, Google Labs, New York Christopher J.C. Burges, Microsoft Research, Redmond.

How DABUS Works

***Instead* of humans** defining a problem and using ML as a tool, For DABUS, AI models interoperate together instead to identify problems and establish solutions independently, **so there is less / minimal human interaction**.



This is a major paradigm shift – the "tool" is generating both problems / solutions autonomously.

DABUS is being used as a set of test cases to promote dialogue about the social, economic, and legal impact of frontier technologies.

Dabus = Device for Autonomous Bootstrapping of Unified Sentience

Image Credit(s):

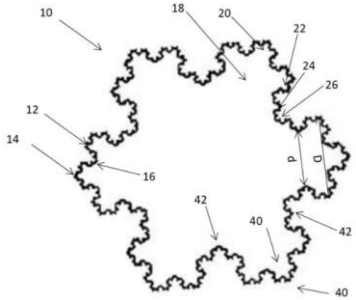
https://artificialinventor.com/

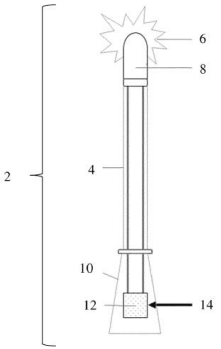
https://imagination-engines.com/dabus.html

DABUS Patent Applications

Dabus is NOT a typical AI/ML patent application where it is being used to solve a particular problem.

Instead, DABUS arguably “develops” its own ideas.





A container for use, for example, for beverages, has a wall with and external surface and an internal wall of substantially uniform thickness. The wall has a fractal profile which provides a series of fractal elements on the interior and exterior surfaces, forming pits and bulges in the profile of the wall and in which a pit as seen from one of the exterior or interior surfaces forms a bulge on the other of the exterior or interior surfaces. The profile enables multiple containers to be coupled together by inter-engagement of pits and bulges on corresponding ones of the containers. The profile also improves grip, as well as heat transfer into and out of the container.

The present invention discloses devices and methods for attracting enhanced attention. Devices include: an input signal of a lacunar pulse train having characteristics of a pulse frequency of approximately four Hertz and a pulse-train fractal dimension of approximately one-half; and at least one controllable light source configured to be pulsatingly operated by the input signal; wherein a neural flame emitted from at least one controllable light source as a result of the lacunar pulse train is adapted to serve as a uniquely-identifiable signal beacon over potentially-competing attention sources by selectively triggering human or artificial anomaly-detection filters, thereby attracting enhanced attention.

(71) **Applicant: THALER, Stephen L.** [US/US]; 1767 Waterfall Dr., St Charles, Missouri 63303 (US).

(72) **Inventor: DABUS, The invention was autonomously generated by an artificial intelligence**; 1767 Waterfall Dr, St Charles, Missouri 63303 (US).

16/524,350 (teaching a “Neural Flame”)

16/524,532 (teaching a “Fractal Container”)

See also:

WO2020079499A1

https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2020079499

11th Annual University of Toronto Patent Colloquium

Can an AI Machine Be an Inventor?

November 11, 2022

Lenczner Slaght

Location:

University of Toronto

Presented By

Jordana Sanft

Who or What Can Be an Inventor?

- **Applicant:** an inventor or the legal representative of an inventor
  - Subsection 27(2) of the *Patent Act* and section 54 of the *Patent Rules*
- **Inventor:** "the person or persons who conceived of" the invention
  - *Apotex Inc v Wellcome Foundation Ltd,* 2002 SCC 77 at paragraph 96
- **Owner:** can transfer or license their rights to others (section 49)
  - No ability to transfer inventorship

- Alexander Graham Bell

- Artificial Intelligence

DABUS: AI Patent applications worldwide

Gervas Wall, Deeth Williams Wall

DABUS

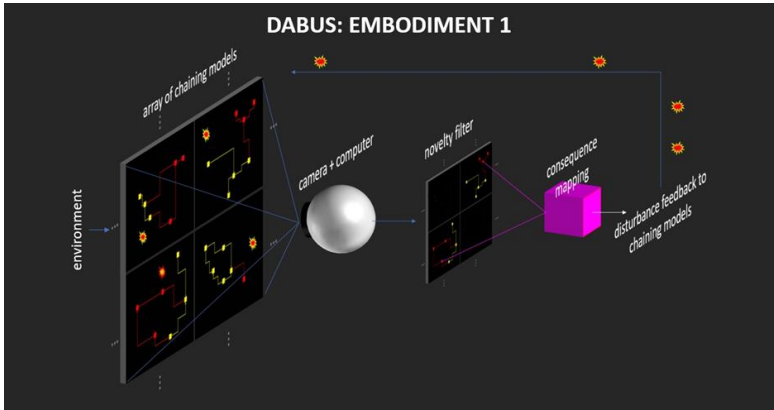
Device for the Autonomous Bootstrapping of Unified Science

Named as inventor on patent applications for inventions relating to beverage container and “neural flame”

DABUS

Artificial neural system comprising a group of linguistic and visual modules connected together

Modules may combine learned visual, semantic, and language elements, reinforce those, and then other modules predict favourable consequences of those combinations, which may be refined further



DABUS

VIII-1-1	**Declaration: Identity of the Inventor** Declaration as to the identity of the inventor (Rules 4.17(i) and 51bis.1(a)(i))	In relation to this international application
	Name (LAST, First)	DABUS, The invention was autonomously generated by an artificial intelligence of
	Address	1767 Waterfall Dr St Charles, Missouri 63303 United States of America is the inventor of the subject matter for which protection is sought by way of this international application

Issues

The applications have faced two main barriers:

- The fundamental one, can AI be an inventor for the purpose of a patent application
- The preliminary one, can AI assign the invention?

Issues

Ownership

- Patent offices assert that AI has no capacity to assign
- DABUS applicant has asserted accession – like livestock

Inventor requirement

- Some countries' laws explicitly define "inventor", others do not
- Definitions may include "individual" or "person"
- Some countries may not require naming an inventor

Status

Inventor issues

- UK – Court of Appeal affirmed denial of application, appeal pending to Supreme Court
- US - United States Court of Appeals for the Federal Circuit affirmed denial of application
- EU – EPO Board of Appeal affirmed denial of application but suggests the owner may be the inventor
- AU - Full Court of the Federal Court of Australia held AI cannot be an inventor
- DE - Federal Patent Court held AI cannot be an inventor
- IN - Controller General of Patents held AI cannot be an inventor

Status

Ownership issues

- AU, UK, EU, Canada, have raised this issue

Other

- Question whether Israel requires naming an inventor
- South Africa granted the patent – deposit system, no examination.

Reference: https://artificialinventor.com/

To Consider:

In the event the invention is made by AI, is it unpatentable merely because you cannot truly name a human inventor?

Or do we go with the first human who understood the invention?

How will AI change the patent bargain?

- The patent bargain provides time-limited exclusive rights “a pseudo-monopoly”, in exchange for a disclosure of an invention and then providing it to the public for use afterwards.

- Patents are a policy instrument for encouraging innovation and knowledge diffusion by applicants, but at the same time, the exclusive rights also restrict third parties.

- Essentially, the patent system attempts to create an economic market for ideas and innovations – facilitating collaborations and transactions for the efficient allocation of assets.

AI and the Inventiveness Analysis

Inventiveness

- State of the art and the inventive concept
  - Breadth of the art available to the AI machine
- Who or what filled the gap from state of the art to inventive concept?
- Problem-solution / inventive concept:
  - Did AI or a human identify the problem to be solved?
- Can AI have inventive ingenuity?

- Does an AI machine qualify as ordinary? skilled? person?
- How to define POSITA?
  - an issue for claims construction as well as grounds of invalidity
- Objective versus subjective analysis

AI Inventions and the Patent System

Utility/Overbreadth

- Identifying practical utility
- Sound prediction
  - factual basis
  - sound line of reasoning
  - disclosure
- Utility in fact ?
- Scope of the claim ?
- Claiming more than invented/disclosed ?

Patent Bargain:

- In exchange for full disclosure a patentee is granted a monopoly for a limited time
- Patent system promotes innovation and progress in science and arts

Discussion: How is the state of the art changing with AI?

- The courts are already struggling with “abstractness” for computer implemented inventions, rejecting applications where generic computers are being used for conventional human activities.

- With the advent of DABUS-type AI where the AI is used not only as a human-guided tool, but AI can be used autonomously:

  - How will the economic balance shift if DABUS is run continuously to generate a large volume of inventions?
  - How will patent principles, such as the test for obviousness / sufficiency, shift?

Discussion:

- How could AI-invented patents increase risk from patent assertion entities?
  - How can or have patent assertion entities extracted value out of patent assets?
  - What tools are available to mitigate that risk?
  - What might happen when a tool like DABUS is used by a patent assertion entity to file a significant number of new filings? An overwhelming new number of filings?

Discussion:

- Are Canadian courts considering patent assertion entities differently than other patentees?
  - Justice Locke in *Seedlings Life Science Ventures, LLC v. Pfizer Canada ULC*, 2021 FCA 154:

    [79] I am particularly concerned about the potential effect of such a broadly defined principle on inventors who recognize that their specialty lies in inventing, and that production and marketing of their inventions are better left to different specialists. Such inventors will seek to license third parties to take their inventions to market as a matter of business efficiency. The broadly defined principle would force such inventors to choose between business efficiency and retaining a potential remedy for infringement of their patent rights. The value of a patent would therefore be reduced for specialist inventors. I see no reason to force such a choice. In my view, business efficiency should be encouraged.

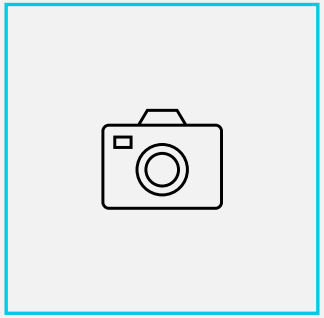
Discussion:

- Patent (inventor) vs copyright (author)

AI Registered as Copyright Co-Author

Starry Night
by Van Gogh

+



Photograph taken
by Ankit Sahni

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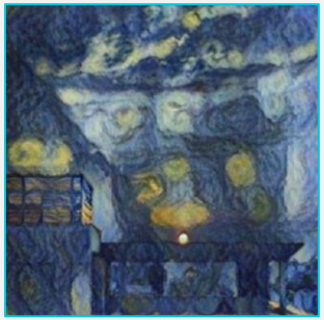

Suryast
by RAGHAV
(AI app)

AI Registered as Copyright Co-Author

Author under the *Copyright Act*

- The author is the first owner of a copyright
- Author is not defined
- Typically, an author:
  - "must be a natural person"
    - *Setana Sport Limited v 2049630 Ontario Inc,* 2007 FC 899 at para 4.
  - "who exercises skill and judgment"
    - *CCH Canadian Ltd v Law Society of Upper Canada*, 2004 SCC 13 at para 16.
- A human co-author met the requirement

Questions or comments?

Thank you!

- Emily Kettel, Moderator
- Bennett Jones LLP

- Jordana Sanft
- Lenczner Slaght LLP

- Gervas Wall
- Deeth Williams Wall LLP

- Brian Chau
- Norton Rose Fulbright