

AI Augmentation and Creativity

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A very brief history of AI

**Early on we thought it's very easy
(50s and 60s)**

A very brief history of AI

The field suffered two consecutive AI winters
(70s and 80s)

<https://www.pexels.com/photo/snow-covered-ground-60561/>

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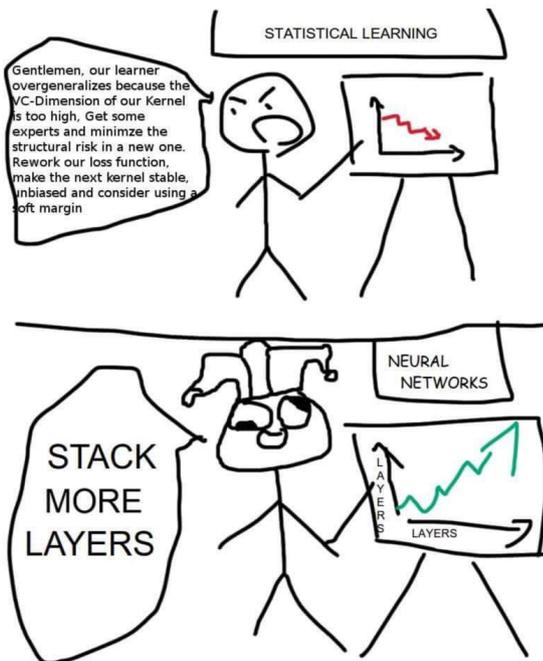


<https://xkcd.com/1838/>

A very brief history of AI

We started to take Machine Learning seriously and the Internet helped
(90s and 2000s)

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A very brief history of AI

We rediscovered Neural Networks (Deep Learning), found large datasets and GPUs (2010s)

https://livingthing.danmackinlay.name/deep_learning.html

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ImageNet: object recognition



- **S: (n) Eskimo dog, husky** (breed of heavy-coated Arctic sled dog)
 - *direct hypernym* / *inherited hypernym* / *sister term*
 - **S: (n) working dog** (any of several breeds of usually large powerful dogs bred to work as draft animals and guard and guide dogs)
 - **S: (n) dog, domestic dog, *Canis familiaris*** (a member of the genus *Canis* (probably descended from the common wolf) that has been domesticated by man since prehistoric times; occurs in many breeds) "the dog barked all night"
 - **S: (n) canine, canid** (any of various furred mammals with nonretractable claws and typically long muzzles)
 - **S: (n) carnivore** (a terrestrial or aquatic flesh-eating mammal) "terrestrial carnivores have four or five clawed digits on each limb"
 - **S: (n) placental, placental mammal, eutherian, eutherian mammal** (mammals having a placenta; all mammals except monotremes and marsupials)
 - **S: (n) mammal, mammalian** (any warm-blooded vertebrate having the skin more or less covered with hair; young are born alive except for the small subclass of monotremes and nourished with milk)
 - **S: (n) vertebrate, craniate** (animals having a bony or cartilaginous skeleton with a segmented spinal column and a large brain enclosed in a skull or cranium)
 - **S: (n) chordate** (any animal of the phylum Chordata having a notochord or spinal column)
 - **S: (n) animal, animate being, beast, brute, creature, fauna** (a living organism characterized by voluntary movement)
 - **S: (n) organism, being** (a living thing that has (or can develop) the ability to act or function independently)
 - **S: (n) living thing, animate thing** (a living (or once living) entity)
 - **S: (n) whole, unit** (an assemblage of parts that is regarded as a single entity) "how big is that part compared to the whole?"; "the team is a unit"
 - **S: (n) object, physical object** (a tangible and visible entity; an entity that can cast a shadow) "It was full of rackets, balls and other objects:"
 - **S: (n) physical entity** (an entity that has physical existence)
 - **S: (n) entity** (that which is perceived or known or inferred to have its own distinct existence (living or nonliving))

<https://qz.com/1034972/the-data-that-changed-the-direction-of-ai-research-and-possibly-the-world/>

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ImageNet: object recognition

2010: Hand-engineered representations + ML
~ 25% error rate



<http://karpathy.github.io/2014/09/02/what-i-learned-from-competing-against-a-convnet-on-imagenet/>

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ImageNet: object recognition

Humans are very good at this
~ 5% error rate

2017: Very Deep Neural Nets
~ 2.5% error rate

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Advances in computer vision enabling self-driving cars



L. Lane Radius: 4.74km
 R. Lane Radius: 1.09km
 C. Position: -0.40m
 Close Vehicles: 2

<https://electrek.co/2016/10/10/tesla-vision-autopilot-autonomous-driving-nvidia-cuda/>
<https://medium.com/@ricardo.zuccolo/self-driving-cars-opencv-and-svm-machine-learning-with-scikit-learn-for-vehicle-detection-on-the-bf88860e055a>



Book me a hotel
for tomorrow!

Diverse applications

Book me a hotel
for tomorrow!

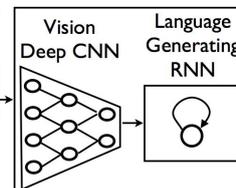
Bucht mir ein Hotel
für morgen

In meteorology, precipitation is any product of the condensation of atmospheric water vapor that falls under **gravity**. The main forms of precipitation include drizzle, rain, sleet, snow, **graupel** and hail... Precipitation forms as smaller droplets coalesce via collision with other rain drops or ice crystals **within a cloud**. Short, intense periods of rain in scattered locations are called "showers".

What causes precipitation to fall?
gravity

What is another main form of precipitation besides drizzle, rain, snow, sleet and hail?
graupel

Where do water droplets collide with ice crystals to form precipitation?
within a cloud

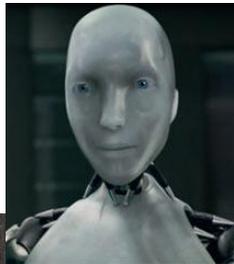
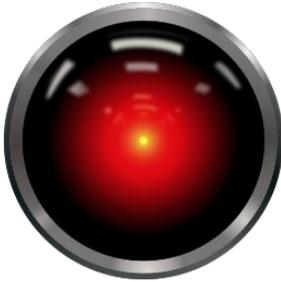
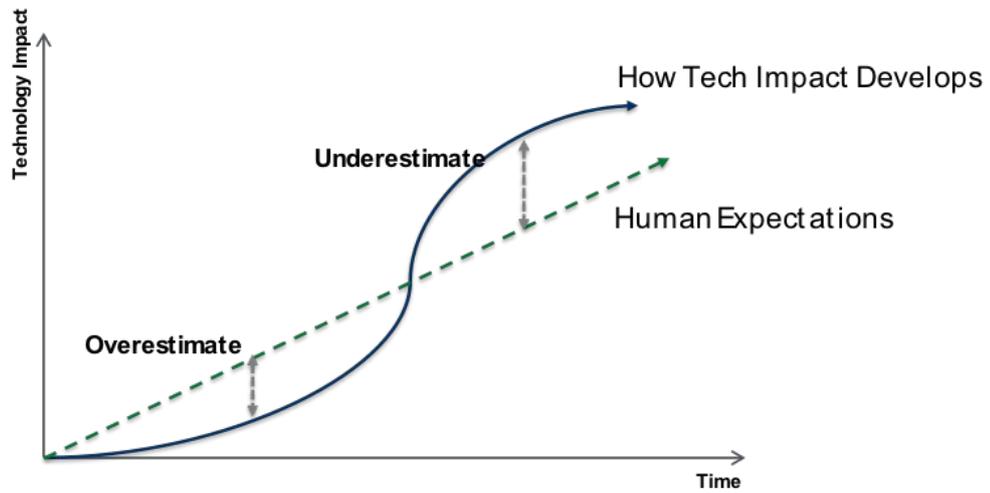


A group of people shopping at an outdoor market.

There are many vegetables at the fruit stand.

<https://openclipart.org/detail/260959/sound-wave> <https://arxiv.org/abs/1609.06647> <https://arxiv.org/abs/1606.05250>

AI hype



Stereotypification of AI

Our mental image of AI is very much influenced by science fiction

FACEBOOK'S ARTIFICIAL INTELLIGENCE ROBOTS SHUT DOWN AFTER THEY START TALKING TO EACH OTHER IN THEIR OWN LANGUAGE

The Telegraph | HOME | NEWS | SI

Technology

News | Reviews | Opinion | Internet security | Social media | Apple | Google | Ne

Technology

Facebook shuts down robots after they invent their own language

Code

Open Source | Platforms | Infrastructure Systems | Hardware Infrastru

14 June | ARTIFICIAL INTELLIGENCE · RESEARCH

Deal or no deal? Training AI bots to negotiate

Anthropomorphisation of AI, fuzzy language, and, bad tech journalism

WIRED | Technology | Science | Culture | Video | Reviews | Magazine

Facebook

Facebook teaches bots how to negotiate. They learn to lie instead

The chatbots came up with their own original and effective responses - including deceptive tactics

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Key misconceptions

AI is about to take over the world

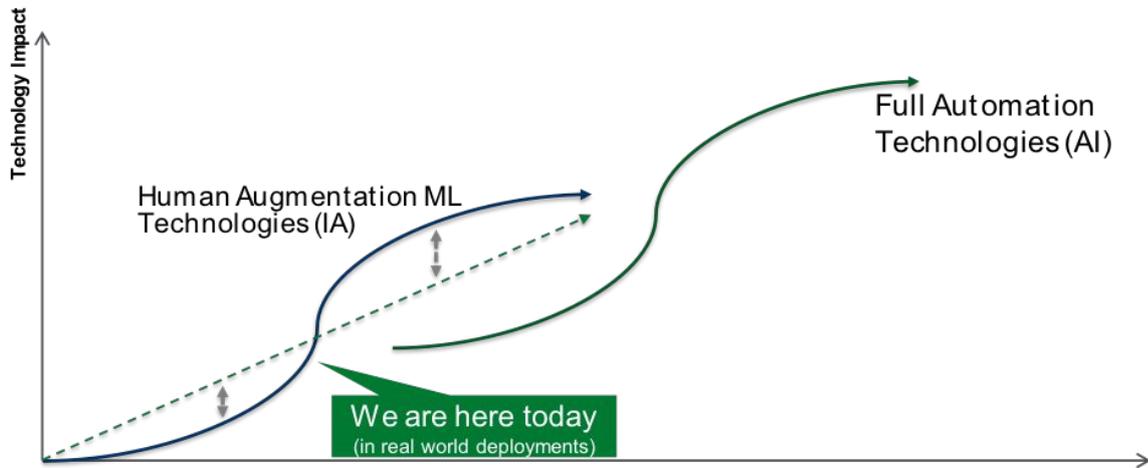
AI is all hype

Progress in AI and automation

Many of us translate advances in AI to automation, replacing humans with machines, job losses, ...

AI Augmentation

AI augmentation



<https://www.cbinsights.com/research/ai-vs-intelligence-augmentation-applications/>

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BenevolentAI: AI-accelerated scientific discovery

1 scientific paper is published every 30 seconds

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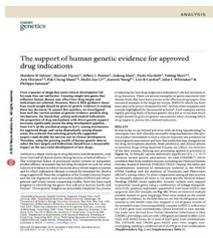
BenevolentAI: AI-accelerated scientific discovery

1 scientific paper is published every **30 seconds**

Individual scientists access a **tiny fraction** of available data in their lifetime - much less than the data generated in **1 day**

AI-Driven knowledge and inference models

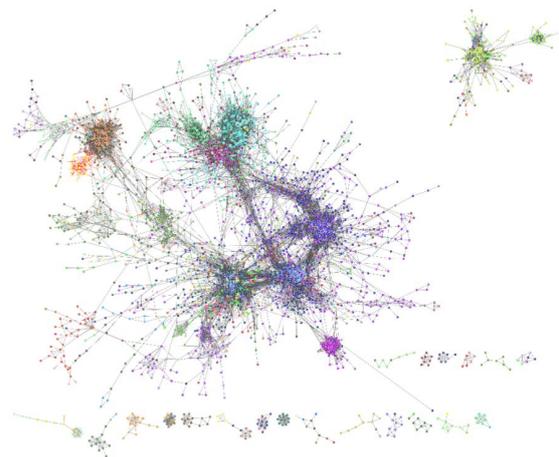
Unstructured Data



Structured Data

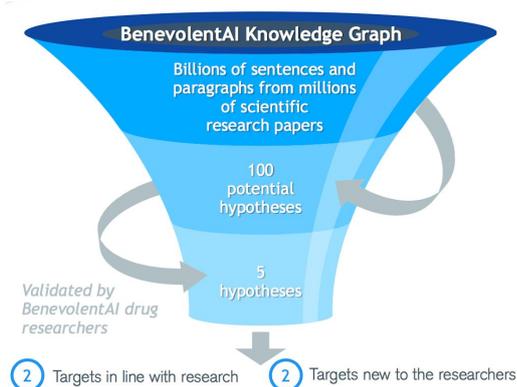


Rich proprietary knowledge



Large Scale NLP,
Machine Learning, Deep
Learning, and Neural
Reasoning Technology

BenevolentAI Finds Potential Treatments for ALS



Validated by SITran, expert researchers on ALS

“ I was impressed by the initial hypotheses that were presented at our first meeting together. One of the ideas was very much a central part of our ongoing research and immediately validated the technology. The second idea was quite a novel one for treatments for ALS. Without the augmentation and insight that the technology allows us, these are possibilities we may have otherwise overlooked. ”
 Dr. Mead, Sheffield Institute of Translational Neuroscience

Medicine and computing

The shoulders of gAInts

The Economist

Artificial intelligence may help unpick the complexity of biology

IN A former leatherwork road in London, a hope up, BenevolentAI's main open-plan. In it, scientists busily on benches, ply trades. The firm's star, the ate, temperature-control star is a powerful computer software which sits at the volentAI's business. This ificial intelligence system At, as it is known for several guises. But Benev of it is a form of machine

“BenevolentAI has already validated on pathway for drug discovery and opened up a surprising new one. What their engine can do is look across vast swaths of information to pick novel ideas repurpose...BenevolentAI has given me two ideas for drugs for ALS, one is bang in the middle of what I and my teams are doing already...AI is generating good ideas. The other is complicated and not obvious, but mechanistically interesting.”

Dr Richard Mead... Lecturer in Neuroscience, University of Sheffield

“Benevolent AI is not a one-off. More and more people and firms believe that AI is well placed to help unpick biology and advance human health...It can in weeks elucidate salient links and offer new ideas that would take lifetimes of human endeavor to come up with. I can also weigh up the evidence for its hypotheses in an evenhanded manner.”

The Economist

FINANCIAL TIMES

Bold claims for AI are hard to compute for economist

This Master Algorithm, as a computer science professor of Washington - it goes on to say, will be the last in man makes. It will be add knowledge in the world - and future - from data. There does appear to be a paradox? Can all three sub- quite possibly, yes.

“AI-enabled technologies could double the economic growth rates of many advanced countries by 2035”

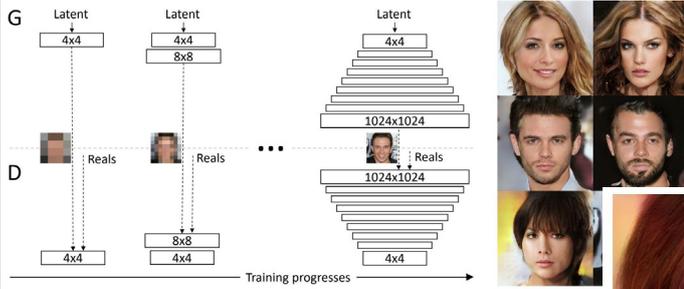
The Financial Times

“It [BenevolentAI] can also personalise solutions for individuals according to their genetic make up, we are really excited about it, the potential is incredible”

Dr Laura Ferraiuolo, PhD, Lecturer in Translational Neurology



Generative Models



<http://research.nvidia.com/sites/default/files/publications/karras2017gan-paper-v2.pdf>

Generative Design



<https://newatlas.com/autodesk-generative-design-interview/50824/>

FEATURED

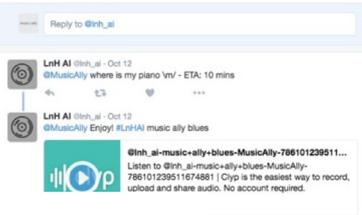
LNH MUSIC

LnH: The Band

Posted on 30/09/2016 by amir / 0 Comment

"LnH: The Band" is an artificial intelligence based musical band. They started originally as a heavy metal band with inspirations from early progressive and power metal bands. Over time they have experimented with other sub-genres of metal and currently have a bit of interest in jazz and blues too.

They are known on Twitter as @lnh_ai where you can find their music and request new compositions by twitting nicely at them.



Music and AI



TECH

THIS A.I. CAN WRITE AND TWEET MUSIC ON COMMAND

Genre: Metal, Tempo: 160, Randomness: 0.5. Fun levels? High.



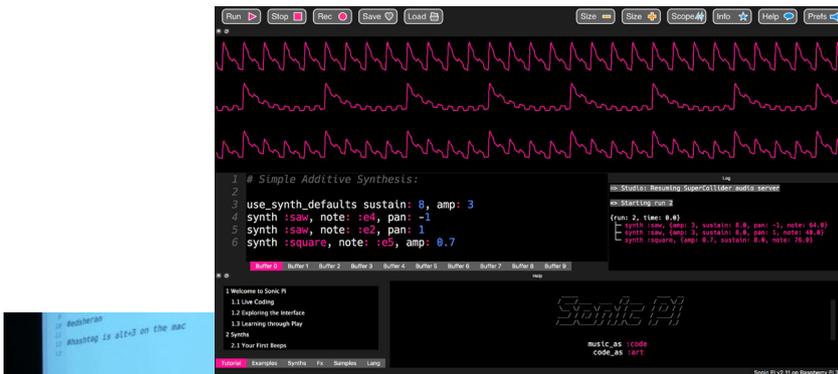
The Musical Twitter Bot: Who Has the Copyright for AI-Facilitated Works?

Blog Social Media & Games Law Blog

Pillsbury Winthrop Shaw Pittman LLP

AI and Education

Personalised and interactive education that is fun!



Human augmentation through AI

scientific discovery, healthcare, education, ...

