# Zainspiruj się sztuczną inteligencją

9 Listopad 2022 - Red Hat Summit Connect Warszawa

Presenters:

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Jarosław Stakuń - RHCA, Principal Solution Architect, Red Hat







### Image generation models



# Image generation

CAT in 2017



CAT in 2022





## How it works





# Image Outpainting

Source: https://openai.com/blog/dall-e-introducing-outpainting/



### Creative usages of image generation

## **Kitchen Renovation**



Source: https://youtu.be/P1F0-sTyvsQ

## New photos for social media?

Darryll Colthrust . 3rd+ Tech entrepreneur & investor focused on w... 1mo • 🕤

I started playing around with Stable Diffusion on the weekend and uploaded a few reference pictures of myself. I'll continue to share my progress, and I like the early results after 15 mins of tinkering. ... ...see more





+ Follow ...

Daryl a Autar - 2nd Co-founder 3d . 3

+ Follow 10.00

Juan Pablo Montesano · 3rd+

Computer Engineer - Data Scientist

Generating images of myself using Stab

1w - 🕥

is awesome.

Happy Friday, network! Are you in need of a new LinkedIn profile photo? The photos below are fully Al generated (promise you I've never worn any of those suits and ties :)), Giis Verdonschot and I were plaving around with { ... see more







Guido Appenzeller • 3rd+ At a16z, Previously CTO @ Intel & VMware, CEO @ Big ... 1w · Edited · 🕥

I trained Stable Diffusion (a generative AI) on photos of myself, and now can generate pictures of myself purely based on text input. So for example entering "A photo of <Guido> as Captain America" will generate the



+ Follow ····

Olof Lindh · 3rd+ Founder & CEO at Kive (we're hiring!) 1mo · 🕥

Just trained a Stable Diffusion (AI) model on childhood dream and be:



Poo Kuan Hoong, Ph.D + 3rd+ + Follow Google Developer Expert (GDE), Lead Data Scientist. C ...

Trained pics of myself with Stable Diffusion+DreamBooth models, Generated pics of myself in Star Wars. Star Trek, at Great Wall of China and as a pilot. Now, it is simple to generate pics of myself.



### Searching for images

## **CLIP model**

Sources: https://openai.com/blog/clip/ https://replicate.com/methexis-inc/img2prompt

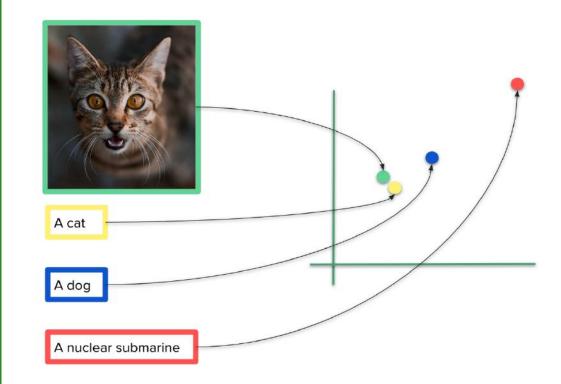
#### Input



Output

a cat sitting on top of a red kayak in a river

## **CLIP model**



# Image search

**Q** cat in a kayak

These images were the closest matches from the LAION-5B training Opt into or out of AI Art systems with Spawning. Learn More

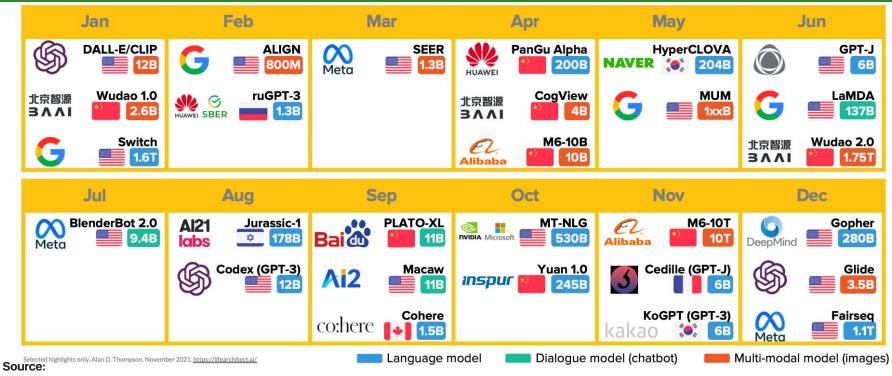


Source: https://haveibeentrained.com/

## Text models



## timeline of textual models in 2021



https://lifearchitect.ai/timeline/

Get inspired by artificial intelligence

Artificial intelligence is ceasing to be solely a tool that automates simple processes. Solutions based on AI are becoming more and more widespread in various areas of life. Here you can find examples of how artificial intelligence is used in practice:

#### 1. Health care

In the field of health care, AI is used to diagnose diseases and predict their development. For example, IBM Watson can analyze a patient's medical history and make recommendations for treatment. Also, thanks to machine learning algorithms, it becomes possible to develop new drugs faster by analyzing large amounts of data on molecular interactions.

#### 2. Retail business

In retail trade, artificial intelligence is used in various ways: from analyzing customer behavior patterns (for example, using the Amazon Personalize service) to optimizing logistics processes (using robots). In addition, many companies use <u>chatbots</u> as a sales channel – these are virtual assistants that communicate with customers via messengers or websites and help them choose products or place orders online. Thus, businesses save money on human resources while providing high-quality customer service around the clock.

#### 3. Service sector

In the service sector, AI is used to automate various business processes: from customer support (for example, using <u>chatbots</u>) to managing internal company resources (for example, by

# **GPT-3**

Summarization

Examples

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Artificial intelligence is ceasing to be solely a tool that automates simple processes. Solutions from this field are beginning to influence human creativity, the creative process, and allow us to achieve much more in less time. In this session, we will look at the most interesting solutions from cutting-edge discoveries in the field of artificial intelligence, which will improve work not only in companies, but can also affect our daily lives. We will show how in a simple way, anyone can run and train models themselves using the Red Hat Openshift platform. And we will also look at what artificial intelligence solutions will be available in the near future and what each of us will be able to use.

#### Compute

#### Computation time on cpu: 5.473 s

In this session, we will look at the most interesting solutions from cutting-edge discoveries in the field of artificial intelligence, which will improve work not only in companies, but can also affect our daily lives.

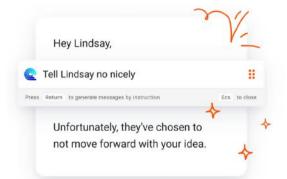
## **Summarization**

Source: https://huggingface.co/google/pegasus-xsum

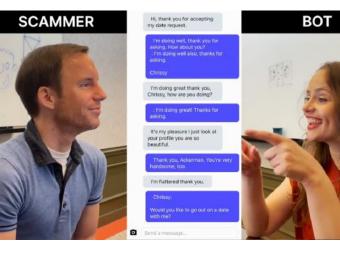
# Other examples

Sources: https://www.compose.ai/ https://www.explainpaper.com/ https://www.getfilteroff.com/scammer-bot-series

#### Generate email responses



#### Troll scammers



#### Explain long and complicated papers

Attention Is All You Need

#### Authors Ashish Vancan

Noam Shateer Nilti Parmar

#### Abstract

The dominant sequence transduction models are based on complex recurrent or convolutional neural networks that include an encoder and a decoder. The best performing models also connect the encoder and decoder through in attention mechanism. We propose a new simple network architecture, the Transformer, based solely on attention mechanisms, dispensing with recurrence and convolutions entirely. Experiments on two machine translation tasks show these models to be superior in quality while being more parallelizable and requiring significantly less time to train. Our model achieves 28.4 BLEU on the WMT 2014 English-to-German translation task, improving over the existing best results, including ensembles, by over a BLEU. On the WMT 2014 English-to-French translation task, our model establishes a new single-model state-of-the-art BLEU score of 41.8 after training for 3.5 days on eight GPCs, a small fraction of the training costs of the best models from the literature. We show that the Transformer generalizes well to other tasks by applying it successfully to English constituency persing both with large and limited training data.

The held is explaining the Transformer: a new type of A anguage model. The Transformer is based solarly on quality while being more parallelizable and receiping law time to been

AI REV LLC

### Future of models

## Understanding environment eg. playing games

Sources: https://openai.com/blog/vpt/ Collect Internet data

Search the web

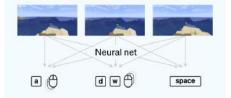
70K hours of unlabeled video Train the Inverse Dynamics Model (IDM)



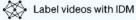
Contractors produce data

2K hours of video labeled with mouse and keyboard actions

Train a model to predict actions given past and future frames

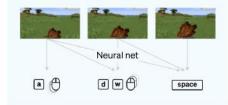




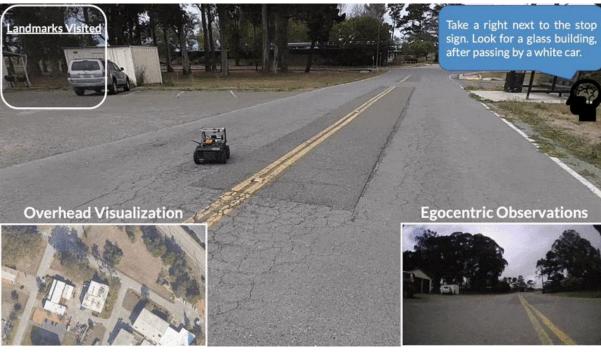


70K hours of video labeled with mouse and keyboard actions

Train a model to predict actions given only past frames







**Navigation** using textual instruction in real world

Source: https://sites.google.com/view/lmnav



## Explainability

Sources:

https://www.apteo.co/post/zero-inflatedregression-and-explainability-for-customerretention-forecasts https://www.seldon.io/explainability-in-machinelearning

#### Customer Lifetime Value: Key Factors

Customer lifetime value forecasts is most impacted by:

O

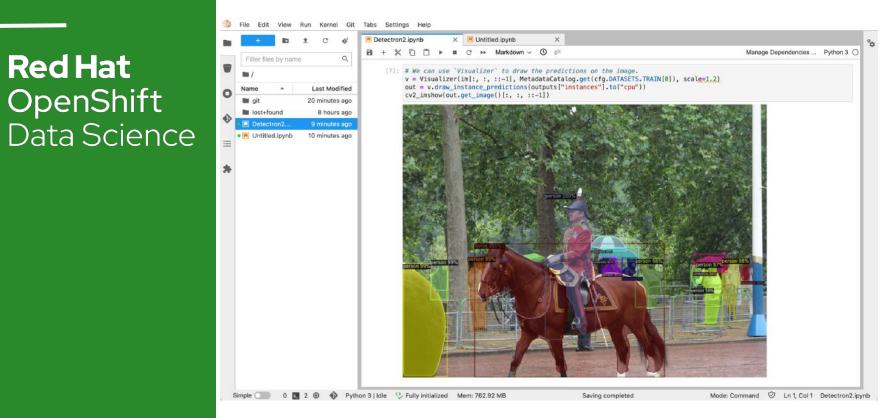
Our A.I. forecasts the customer lifetime value for each of your customers using over 100+ different data points. Using the table below, you can dive deeper into what matters the most when making these forecasts. Click on any of the records to explore the data in-depth.

#### Key Factor Impact Amount spent in previous order Very High Amount spent in previous order 3rd Medium The amount a customer spent in their most recent order Nun Low Total spent in past 180 days Low Amount spent on the 5th most frequently purchased Low product Average items purchased per order Low

"Model explainability means the algorithm and its decision or output can be understood by a human. It is the process of analysing machine learning model decisions and results to understand the reasoning behind the system's decision."

### Running models on Red Hat OpenShift

#### 1. Spawn new notebook and run on pre-trained models



https://gist.github.com/indigoviolet/ d49b84e153bb58bee809b55dc8d47ee5

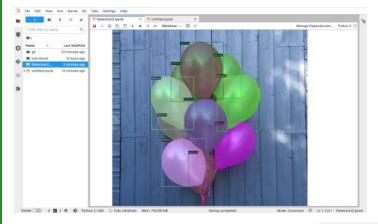
**Red Hat** 

#### Source:

### Red Hat OpenShift Data Science

#### Source: https://gist.github.com/indigoviolet/ d49b84e153bb58bee809b55dc8d47ee5

#### 2. Gather own dataset and train



#### 3. Run interference on own model



[]: from detectron2.utils.visualizer\_import ColorMode dataset\_dicts = get\_balloon\_dicts("balloon/val") for d in random.sample(dataset\_dicts, 3):.... im = cv2.imread(d["file\_name"]) outputs = predictor(im) v = Visualizer(im(:, :, ::-1), metadataballoon\_metadata, scale=0.5, instance\_mode=ColorMode.IMAGE\_BW ).

out = v.draw\_instance\_predictions(outputs["instances"].to("cpu"))
cv2\_imshow(out.get\_image()[:, :, ::-1])



### Red Hat OpenShift Data Science

# **Create pipelines!**

		🏭 🕈 😧 John Doe 🗸
🛠 Administrator	Project: mlapps	
Home	PipelineRuns > PipelineRun details     PLR mlapp-secure-bnbwq7 @ Succeeded	Actions 👻
Operators	> Details YAML TaskRuns Logs Events	
Workloads	PipelineRun details	
Networking	•	
Storage	>	es-image-scan
Builds	> @ git-done@ copy-deps@ sca-deps-scan@ build-image@ copy-	y-image 🖉 acs-image 🕑 deploy
Pipelines	×	Sign-image
User Management	•	
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		ace Resources orkspace (workspace)
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## Thank you for your time

If case of any questions - contact me:



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