



Review of Tutorial & Workshop

CVPR 2023 Virtual Platform



Access schedules, papers,
workshops, tutorials, etc.

CVPR 2023 Slido Site



Attendee engagement (Q&A, polls, etc.) for
plenary sessions: keynotes, panels, orals.

YeongHyeon Park

Department of Electrical and Computer Engineering

SungKyunKwan University

Experiences

Good

- Better streaming service compared to CVPR 22' (Zoom)
- Individual real-time chatting app is provided (Rocket.Chat)
- Seat and comfort are guaranteed
- Easy to move for another session

Lack

- Some sessions are offline only (without any notice in advance)
- Quality varies from session by session (host by host, speaker by speaker)

Rocket.Chat



By joining this chat you are acknowledging that you have read and will abide by the CVPR Code of Conduct as shown on the CVPR website. Attendees of any sessions are reminded that Digital ...

need a link for rehistered

yalong-pi 오전 12시 36분
https://www.youtube.com/watch?v=sO-dZk714ys&list=PL_bDvITUyucDYV0Ejk4uCTyFq613-uahd&index=3

Link Preview ▾


CVPR 2023
YouTube | ComputerVisionFoundation Videos

4 4 10

Iakshmi-sekar-sekar 오전 12시 36분
Yes finally

volker-van-aken 오전 12시 43분
Can someone provide a link to the AI Video- from this converence, please.

sungho-kang 오전 12시 46분
https://www.youtube.com/watch?v=sO-dZk714ys&list=PL_bDvITUyucDYV0Ejk4uCTyFq613-uahd&index=4

Link Preview ▾


CVPR 2023
YouTube | ComputerVisionFoundation Videos

2

victor-escoria-he-him 오전 1시 53분
I missed the slide biz
Where is that?

kun-yan 오전 2시 32분
I missed it too,,,

메시지

Day 1

June 18, 2023		Sunday
11:50pm - 12:00am	● [Workshop East Ballroom A] Bertasius, Girdhar, ... Carreira The 2nd International Workshop on Transformers for Vision in The 2nd International Workshop on Transformers for Vision	
June 19, 2023		Monday
12:00am - 9:30am	● [Workshop East Ballroom A] Bertasius, Girdhar, ... Carreira The 2nd International Workshop on Transformers for Vision in The 2nd International Workshop on Transformers for Vision	
12:00am - 11:00am	● [Workshop West 306] Timofte, Conde, ... Van Gool 8th New Trends in Image Restoration and Enhancement Workshop and Challenges in 8th New Trends in Image Restoration and Enhancement Workshop and Challenges	
12:00am - 8:30am	● [Workshop West 217 - 219] Ratha, Karanam, ... pankanti The Fourth Workshop on Fair, Data-efficient, and Trusted Computer Vision in The Fourth Workshop on Fair, Data-efficient, and Trusted Computer Vision	
Plan-A		
12:30am - 9:15am	● [Tutorial] Pang, Zhou, ... Sohn Recent advances in anomaly detection	✓
12:30am - 4:30am	● [Workshop East 13] Pemula, Brox, ... Bergmann VAND: Visual Anomaly and Novelty Detection in VAND: Visual Anomaly and Novelty Detection	✓
1:00am - 4:00am	● [Tutorial] Chefer Paul All Things ViTs: Understanding and Interpreting Attention in Vision	✓
Plan-B2		
5:30am - 9:30am	● [Workshop West 211] Saleh, Zheng, ... Yang 2nd Workshop and Challenge on Vision Datasets Understanding in 2nd Workshop and Challenge on Vision Datasets Understanding	

Day 2

	June 20, 2023	Tuesday
Plan-D	12:00am - 10:00am	● [Workshop West 209] Gallego, Scaramuzza, ... Migliore 4th International Workshop on Event-based Vision in 4th International Workshop on Event-based Vision
Plan-C	12:20am - 4:30am	● [Workshop East 18] Wang, Pons-Moll, ... Bhatnagar First Rhobin Challenge - Reconstruction of human-object interaction in First Rhobin Challenge - Reconstruction of human-object interaction
Plan-A	1:00am - 9:10am	● [Workshop East 3] Siam, Wang, ... Derpanis L3D-IVU: 2nd Workshop on Learning with Limited Labelled Data for Image and Video Understanding in L3D-IVU: 2nd Workshop on Learning with Limited Labelled Data for Image and Video Understanding
Plan-B	1:00am - 4:00am	● [Tutorial] Zheng, Zou, ... Fu Optics for Better AI: Capturing and Synthesizing Realistic Data for Low-light Enhancement
	1:00am - 4:00am	● [Workshop East 12] Pizzi, Patel, ... Douze Visual Copy Detection Workshop in Visual Copy Detection Workshop
	4:45am - 10:05am	● [Workshop East Exhibit Hall B] Bhattacharjee, Jain, ... Forsyth Scholars vs Big Models — How Can Academics Adapt? in Scholars vs Big Models — How Can Academics Adapt?
	5:30am - 8:30am	● [Tutorial] Kundtz, Robinson, Hedges Exploring Synthetic data as an Enterprise Capability for Training and Validating CV Systems

All Things ViTs

Tutorial: All Things ViTs: Understanding and Interpreting Attention in Vision

Organizers: Hila Chefer
Sayak Paul

Location: West 211

Time: Half Day - Morning (0900-1200)



Organizer



Hila Chefer

Ph.D. Candidate at Tel Aviv University.

Q&A manager



Sayak Paul

Working at Hugging Face.
(B.Tech at Netaji Subhash Engineering College)

Guest



Ron Mokady

Ph.D. Candidate at Tel Aviv University.

Focused on Academic

All Things ViTs

Q1: Evaluating explainability tools

Given a definition, how do we evaluate explanations?

- Typically evaluated by negative + positive perturbation tests.
 - Remove the most / least important pixels by the method and observe the decrease in accuracy.
 - These metrics are problematic, since they create out-of-distribution input images.
 - Evaluating explanations is an active field of research.

A Benchmark for Interpretability Methods in Deep Neural Networks, Hooker et al., 2019

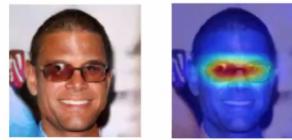
Q3: Can we go beyond attention for interpretation?

Transformers are not just the attention layers!

- Where is the learned information encoded? Is it correct to focus the research on just attention?
- For LLMs, it has been shown that a lot of the information is encoded in the feed forward layers: “key-value memories”.

Q2: Are smaller models more explainable?

Input prompt: “a man with eyeglasses”



CLIP w/ ViT-B/16

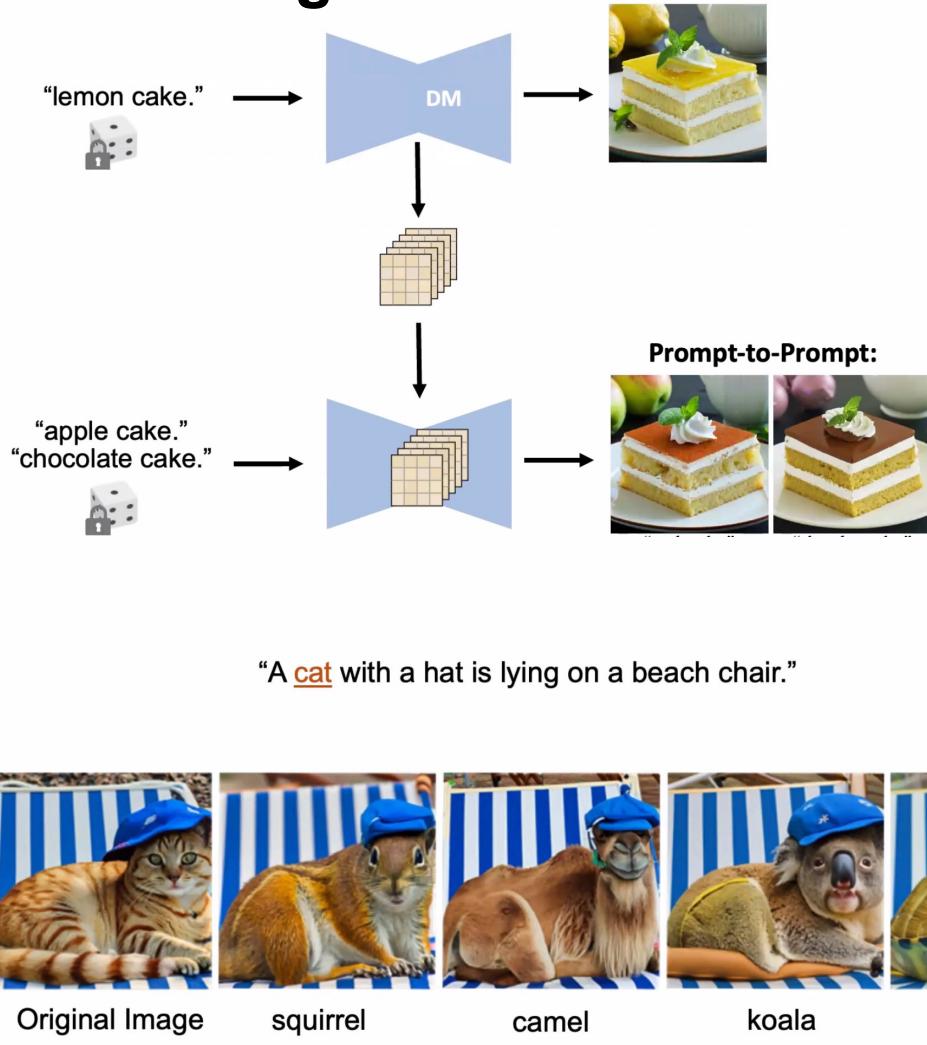


CLIP w/ ViT-L/14

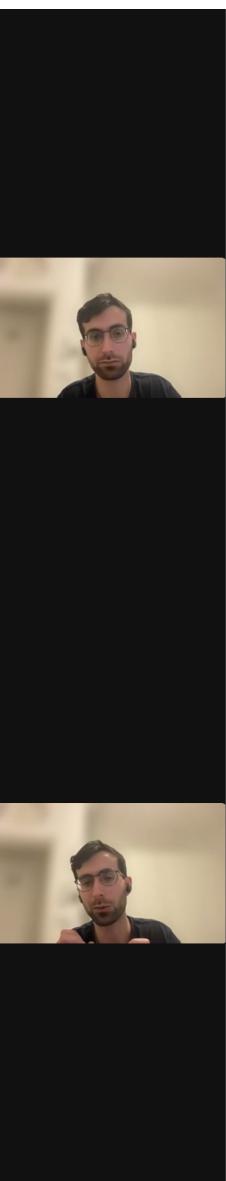
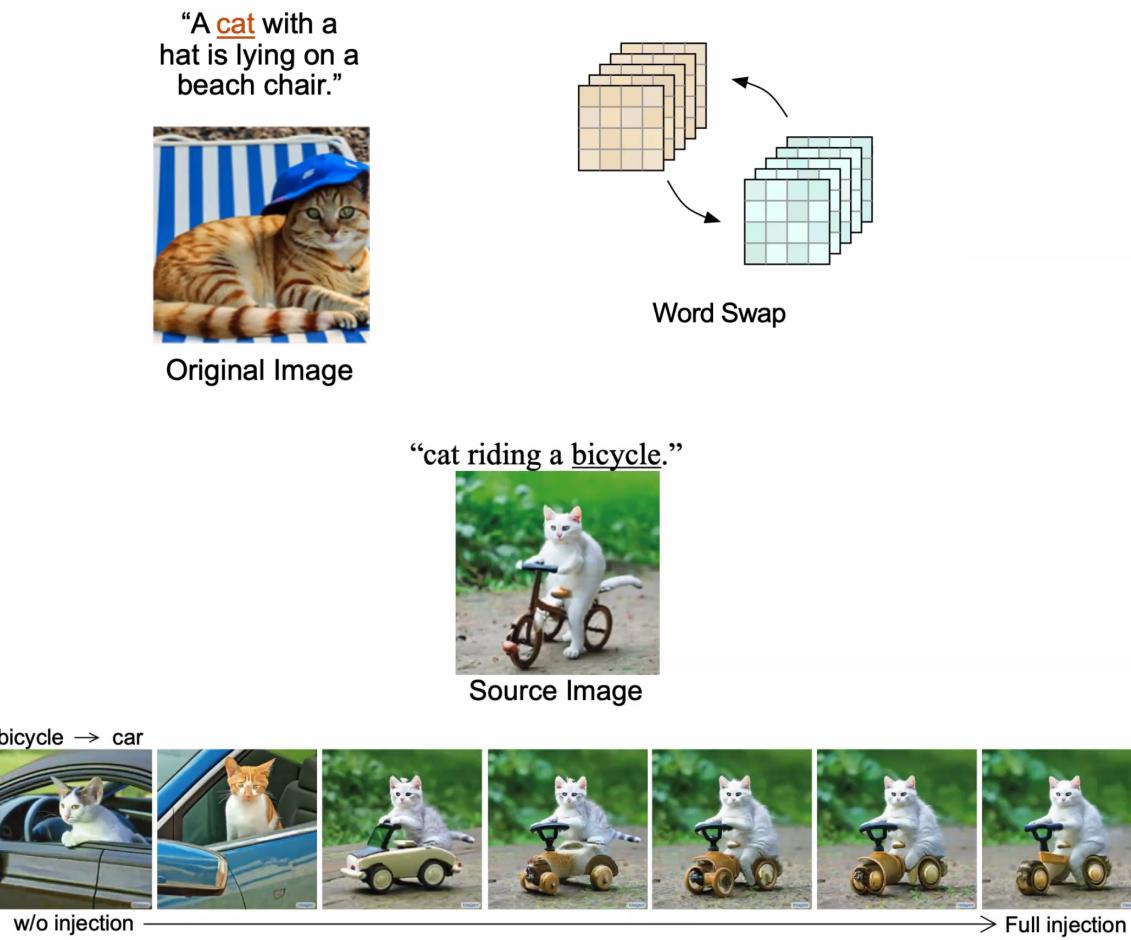
Learning Transferable Visual Models From Natural Language Supervision, Radford et al., 2021
Generic Attention-model Explainability for Interpreting Bi-Modal and Encoder-Decoder Transformers, Chefer et al., 2021



All Things ViTs



Word Replacement



Optics for Better AI

Tutorial: Optics for Better AI: Capturing and Synthesizing Realistic Data for Low-Light Enhancement

Organizers: Yinqiang Zheng

Yunhao Zou

Haiyang Jiang

Ying Fu

Location: West 114-115

Time: Half Day - Morning (0900-1200)



Yinqiang Zheng



Yunhao Zou



Haiyang Jiang



Ying Fu

Focused on Industry

Optics for Better AI

Recording

2023 IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Tutorial
Optics for Better AI - Capturing and Synthesizing Realistic Data for Low-light Enhancement

JUNE 18-22, 2023 CVPR VANCOUVER, CANADA

Our Focus: RAW & Enhancement

The diagram illustrates the optical path from a light source (sun) through media (clouds) to an object (tree). It also shows the camera capturing the scene. The processed output is a Raw Image, which undergoes Image Signal Processing (ISP) steps: Dark Pixel Correction, Black Level Correction, and Image Compression to produce an sRGB Image.

Light source:

1. Intensity
2. Spectrum
3. Polarization

Media in light propagation:

1. Scattering
2. Absorption

Object:

1. 3D Geometry
2. Reflectance
3. Motion

Camera:

1. Sensitivity
2. Spectral Response
3. Exposure Mode
4. Polarization

Image Signal Processing (ISP)

- Weak signals tend to be destroyed
- ISP is very complex which is hard to model
- RAW includes noises that have been well studied

YeongHyeon Park, Dept. of ECE, SKKU

Optics for Better AI

Recording

2023 IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Tutorial
Optics for Better AI - Capturing and Synthesizing Realistic Data for Low-light Enhancement

JUNE 18-22, 2023 CVPR VANCOUVER, CANADA

Low-Light Imaging is Very Challenging

- Issues from bad lighting: loss of image detail, color distortion, high noise
- Affecting **visual quality** and **downstream** vision tasks

The diagram illustrates the challenge of low-light imaging. On the left, a dark blue box labeled "Image" contains the text "Low-light Image". An arrow labeled "Fail" points to a central box titled "Vision Tasks". This box contains four smaller images: "Visual Perception" (a blurry indoor scene), "Object Detection" (a blurry outdoor scene with people), "Depth Estimation" (a blurry heatmap of a scene), and "Other tasks" (a blurry image). Ellipses between "Depth Estimation" and "Other tasks" indicate more tasks.

2023 IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Tutorial
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Low-Light Enhancement in sRGB Domain

- Task: translate low-light images into normal-light ones

The diagram shows the process of low-light enhancement. On the left, a dark street scene with buildings and cars is labeled "Low-light Image". An orange arrow labeled "Low-light Enhancement" points to the same scene, which appears much brighter and clearer on the right, labeled "Normal-light Image".

5

7

Optics for Better AI

Recording

東京大学 北京理工大学

2023 IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Tutorial
Optics for Better AI - Capturing and Synthesizing Realistic Data for Low-light Enhancement

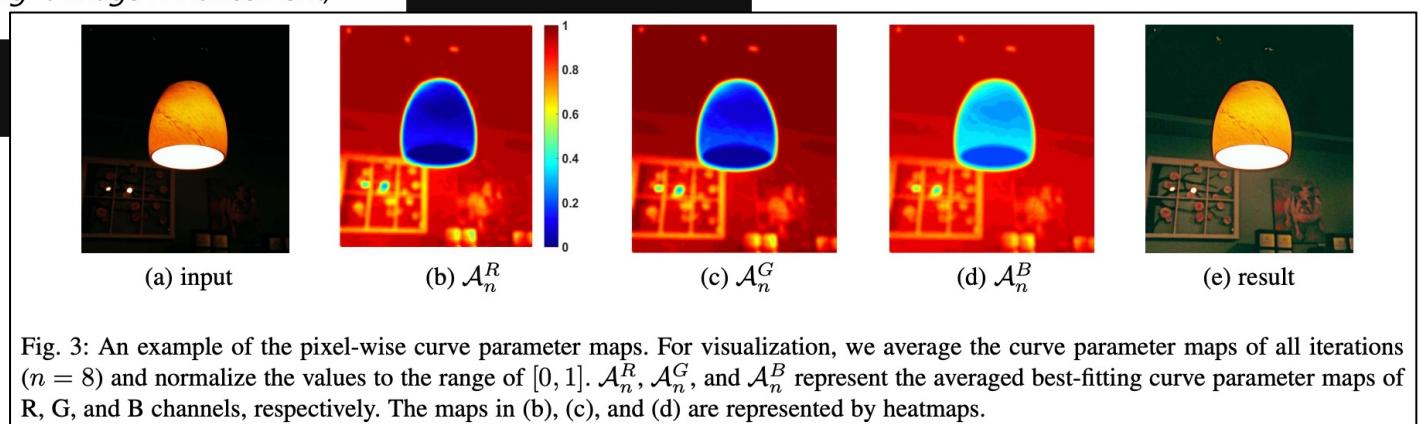
JUNE 18-22, 2023 CVPR VANCOUVER, CANADA

Low-Light Enhancement in sRGB Domain

- Zero-DCE [2] is the first low-light enhancement network that is independent of paired and unpaired training data

- zero-reference
 - image-specific curve estimation with a deep network

[2] Guo et al., Zero-Reference Deep Curve Estimation for Low-Light Image Enhancement, CVPR 2020



Others

New Trends in Image Restoration and Enhancement

Organizers:	Radu Timofte Marcos V. Conde Florin-Alexandru Vasluiianu Ren Yang Yawei Li Kai Zhang Shuhang Gu Ming-Hsuan Yang Lei Zhang Kyoung Mu Lee Eli Shechtman Yulan Guo	Codruta O. Ancuti Cosmin Ancuti Chao Dong Xintao Wang Sira Ferradans Tom Bishop Longguang Wang Yingqian Wang Fabio Tosi Pierluigi Zama Ramirez Luigi Di Stefano Luc Van Gool
Location:	West 306	
Time:	Full Day (0800-1900)	



Record: <https://www.youtube.com/watch?v=abZcZBA7L8I>

Record: <https://www.youtube.com/watch?v=dXxrzWeybBo>

Tutorial: Recent Advances in Anomaly Detection

Organizers:	Guansong Pang Joey Tianyi Zhou Radu Tudor Ionescu	Yu Tian Kihyuk Sohn
Location:	East 18	
Time:	Full Day (0830-0515)	

Summary: The tutorial will present a comprehensive review of recent advances in (deep) anomaly detection on image and video data. Three major AD paradigms will be discussed, including unsupervised/self-supervised approaches (anomaly-free training data), semi-supervised approaches (few-shot training anomaly examples are available), and weakly-supervised approaches (video-level labels are available for frame-level detection). Additionally, we will also touch on anomaly segmentation tasks, focusing on autonomous driving settings. The tutorial will be ended with a panel discussion on AD challenges and opportunities.



New Trends in Image Restoration

LIVE 사용자 지정 라이브 스트리밍 서비스 ▾

Selective Bokeh Effect Transformation

Juewen Peng¹, Zhiyu Pan¹, Chengxin Liu¹, Xianrui Luo¹, Huiqiang Sun¹,
Liao Shen¹, Ke Xian², Zhiguo Cao^{1*}

¹Huazhong University of Science and Technology
²Nanyang Technological University

00:02 -04:56

In this video, we will introduce our work "Selective Bokeh Effect Transformation".

00:02 -04:56/04:58

Andrey Ignatov
Marcos Conde
Zhihao Yang
qian wang
Ethan Anders...
Ruirong Gang
Barbara Haupt
Furkan Kinli
Bolt
Siddhartha N...

Pre-recording....

New Trends in Image Restoration

LIVE 사용자 지정 라이브 스트리밍 서비스 ▾

➤ Dataset

Synthetic

Source Image Target Image Alpha Mask

Real

Source Image Target Image

Training: 20k synthetic | source image, target image, alpha mask and camera parameters

Test: 95 synthetic + 85 real | source image

The Challenge introduces a novel dataset BETD. The training set contains 20k synthetic samples, and each sample consists of a source image, a target image, an alpha mask and camera parameters.

Y
Andrey Ignatov
Marcos Conde
Zhihao Yang
qian wang
Ethan Anders...
Ruipeng Gang
Barbara Haupt
Furkan Kinli
Bolt
Siddhartha N...

Recent advances in anomaly detection

Recording

참가자가 카메라 사용하도록 설정했습니다. 이 대화 내용을 볼 수 있는 사람은 누구인가? 기록이 켜져 있음 X

Meta-OoD: Include Pseudo Anomalies

- Approximate the out-distribution via images from the COCO dataset
- Only consider COCO images with instances that are not included in Cityscapes (no persons, no cars, no traffic lights, etc.) **Synthetic data approach**
- None of the OoD objects in the test data have been seen during the OoD training since they use disjoint datasets for training and testing



Recent advances in anomaly detection

AnomalyMix

AnomalyMix cuts the anomalous objects from an outlier dataset (e.g., COCO) using its labelled masks and paste them into the images of the inlier dataset (e.g., CitySpace)

Make sure that selected COCO images that do not contain objects in Cityscapes and Fishyscapes

Exploring Synthetic data (Rendered.AI)

Random Placement

Object Generators

Number of Objects

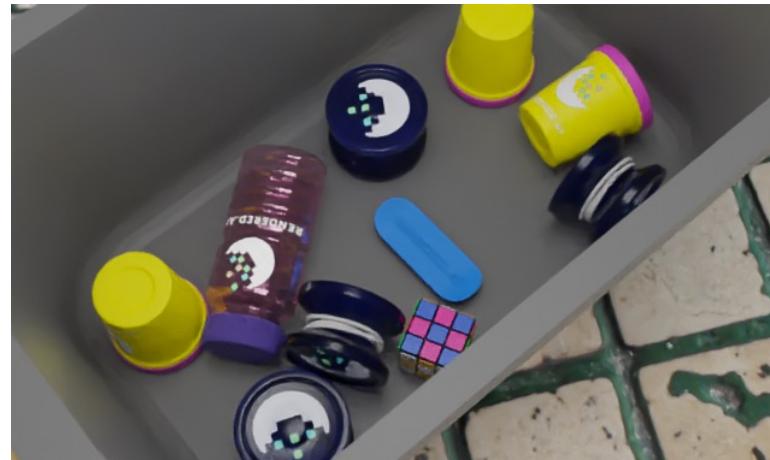
Objects



Container

Container Type

Container Generator



Floor

Floor Type

Floor Generator

Random Placement

Object Generators

Number of Objects

Objects

Container

Container Type

Container Generator

Floor

Floor Type

Floor Generator

Workshop 1

Machine Learning with Synthetic Data (SyntML)

June 19, 13:00 PM - 16:55 PM (CDT)

June 20, 03:00 AM - 06:55 AM (KST)



Vladlen Koltun

Apple
(Intel prior to Apple)



Sanja Fidler

University of Toronto
VP of AI Research, NVIDIA



Raquel Urtasun

University of Toronto
Founder & CEO Waabi



Jonathan Laserson

Datagen



Main Conference

Revisiting Old Ideas With Modern Hardware



JUNE 18-22, 2023
CVPR VANCOUVER, CANADA

Seven deadly sins of predicting the future of AI

<https://www.technologyreview.com/2017/10/06/241837/the-seven-deadly-sins-of-ai-predictions/>

<https://rodneybrooks.com/blog>

Over and Under Estimating



Indistinguishable from Magic



Performance versus Competence



Speed of Deployment



Hollywood Scenarios



Exponentialism



Suitcase Words



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History and Future of Artificial Intelligence and Computer Vision



Linda Shapiro

Someone is competing to get the best results on that dataset and that makes absolutely no sense in the real world actually. Everyone in the world is competing to get the scores on a dataset.