

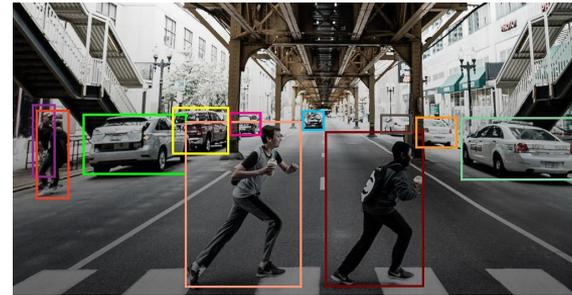
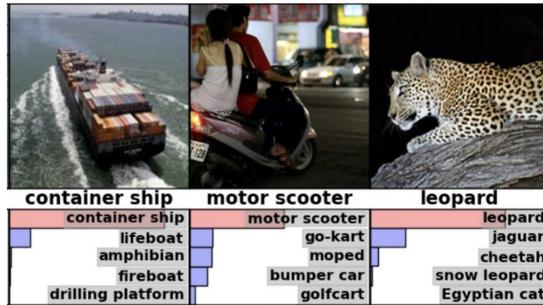
Seminar Vision Systems MA-INF 4208

04.02.2022

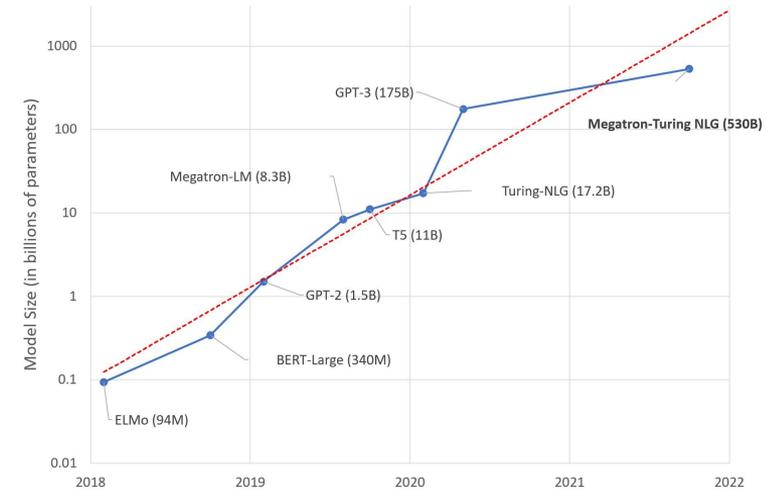
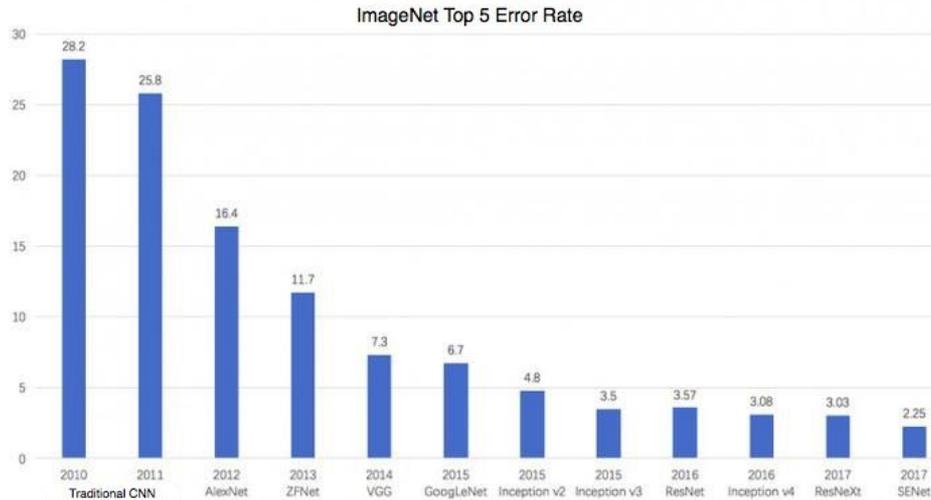
PROF. SVEN BEHNKE, ANGEL VILLAR-CORRALES

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The Age of Deep Learning



The Age of Deep Learning



The Age of Deep Learning



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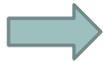


TESLA



In this seminar...

- Acquire/improve ability to:
 - deal with scientific publications (e.g., papers)
 - write a scientific report
 - present a scientific topic to an audience
 - engage technical topics

 Important skills for Master Thesis!

In this seminar

- Discuss trending topics in deep learning and computer vision
- We will cover the following topics
 - Self-Supervised Learning
 - Advances in Neural Network Architectures
 - Object-Centric Learning with Neural Networks

Paper List: <https://www.ais.uni-bonn.de/WS2122/SeminarVision/PaperList.pdf>

Self-Supervised Learning

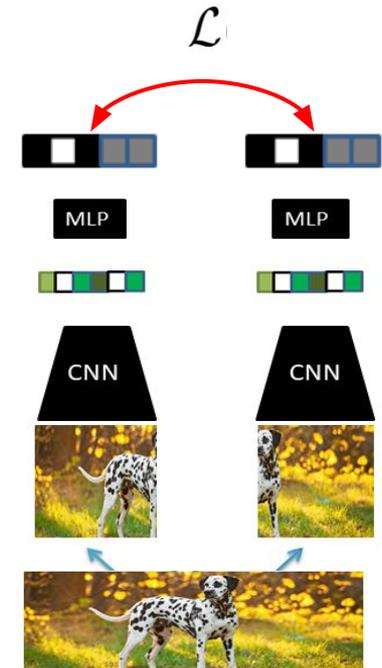
- Subcategory of unsupervised learning
- Use pretext task to train in a supervised fashion
- Hot-topic in deep learning community
 - Comparable to supervised pretraining
 - No need for manual annotations

Google Scholar "self-supervised" "contrastive learning"

Articles About 3.880 results (0,10 sec)

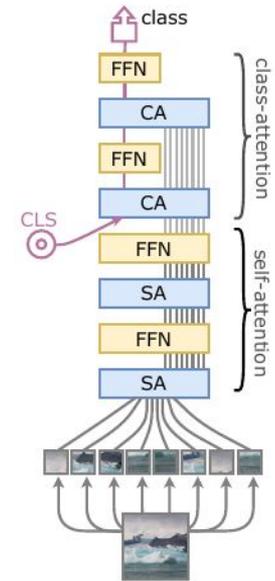
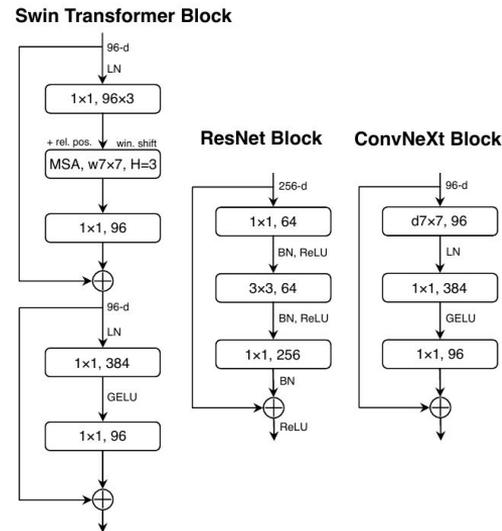
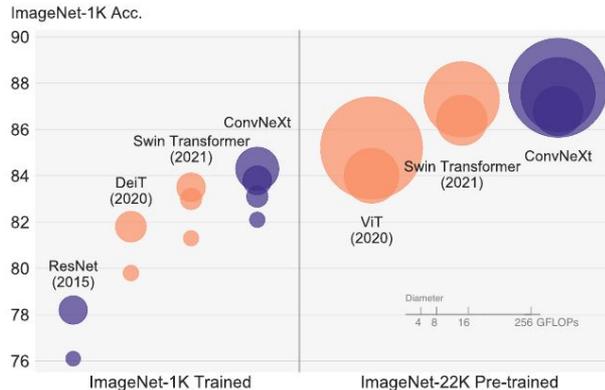
Any time
 Since 2022
Since 2021
 Since 2018
 Custom range...

Dense contrastive learning for self-supervised visual pre-training
 X Wang, R Zhang, C Shen... - Proceedings of the ..., 2021 - openaccess.thecvf.com
 ... existing **self-supervised** learning ... **self-supervised** learning method that directly works at the level of pixels (or local features) by taking into account the correspondence between local features. We present dense **contrastive learning** (DenseCL), which implements **self-supervised** ...
 ☆ Save 📄 Cite Cited by 72 Related articles All 6 versions 🔗



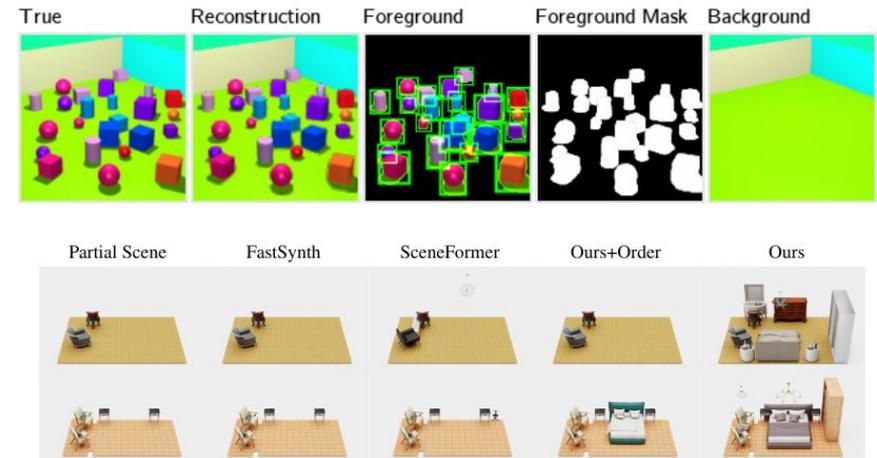
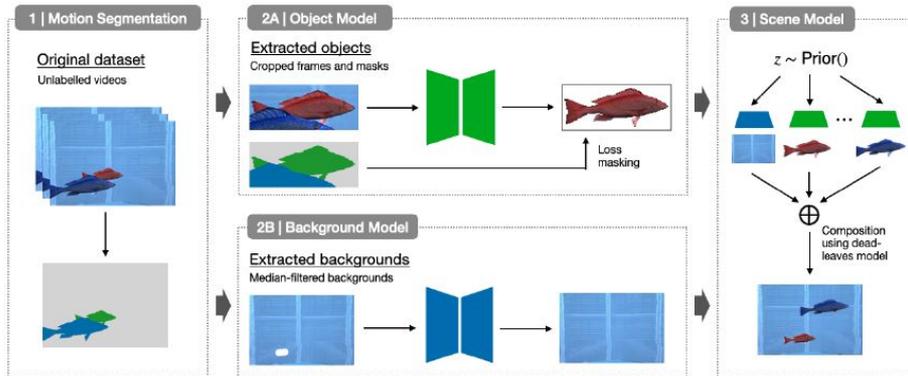
Advances in Neural Network Architectures

- Novel architectures and recent advances for computer vision
 - Transformer-based
 - CNNs
 - Hybrid Architectures



Object-Centric Learning

- Unsupervised learning of object representations with structured models:
 - Unsupervised segmentation
 - Object synthesis and scene completion



Select your topic

- Use the Doodle to select a paper to review
 - Link on Seminar Website
 - First come first serve
- Send me an email at villar@ais.uni-bonn.de
 - Your name
 - Matricule number
 - Your selected topic
- Register in BASIS

Deliverables

- Presentation: Thursday 31.03.2022
 - 30 min presentation
 - 15 min discussion
- Report: Thursday 07.04.2022
 - LaTeX template
 - 8-12 pages
 - Brief but readable and informative
 - BibTex citations

 Arrange a meeting with me \approx 2 weeks before the presentation to check the preliminary materials for the presentation and report.

Report

- Well structured:
 - Abstract
 - Introduction, methods, results, conclusion, ...
 - Tables and figures
 - Correct citations

- Your own scientific opinion:
 - What are the weak points of the paper?
 - What is missing?
 - Are comparisons fair and believable?
 - Possible future steps?

We don't want a copy of the paper!

Grading

- 50%: Presentation
 - Quality of the presentation slides
 - Presentation skills
 - Ability to answer questions
- 50%: Report
 - Overall quality of the report
 - Critical thinking and own discussion
 - Understanding of the concept

Slot Assignment Selection

- Six slots for students
 - Assigned at random

Questions?

