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Habib Slim

Education

2023 **PhD Student (Computer Vision)**
KAUST, Visual Computing Center, Vision-CAIR - Mecca, Saudi Arabia
Supervisor: Dr. Mohamed H. Elhoseiny

2019 – 2021 **Master of Research (Data Science)**
Grenoble INP & Université Grenoble-Alpes (dual degree) - Grenoble, France
GPA: 17.24/20. ***Honors:*** Summa cum laude (mention "très bien"). ***Rank:*** Ranked 1^{st}.
Main courses : ML for Comp. Vis. and Audio, Kernel methods for ML, Fundamentals of Probabilistic Data Mining, Intelligent Systems
Advisors: Pr. Massih-Reza Amini, Pr. Martin Heusse
Awards: ANR Excellence Scholarship

2018 – 2021 **Master of Engineering (Applied Mathematics and Computer Science)**
Grenoble INP - Grenoble, France
Main courses: Information Theory, Language Theory, Operations Research, Probability and Statistics

Experience

2021 – 2021 **Research Intern**
Université Paris-Saclay, Cea-List - Paris, France
Supervisor: Dr. Adrian Popescu
Continual learning methods for image classification.

2020 – 2020 **Research Intern**
Université Grenoble-Alpes, Lig-Cnrs - Grenoble, France
Supervisor: Pr. Georges Quénot
Improving the diversity of class-conditional generative networks for image classification.

Publications

- **Habib Slim***, Xiang Li, Yuchen Li, Mahmoud Ahmed, Mohamed Ayman, Ujjwal Upadhyay Ahmed Abdelreheem, Arpit Prajapati, Suhail Pothigara, Peter Wonka, Mohamed Elhoseiny – *"3DCoMPaT++: An improved Large-scale 3D Vision Dataset for Compositional Recognition"* - **Under review, TPAMI**, 2023.
- Yuchen Li*, Ujjwal Upadhyay*, **Habib Slim***, Ahmed Abdelreheem, Suhail Pothigara, Peter Wonka, Mohamed Elhoseiny – *"3DCoMPaT: Composition of Materials on Parts of 3D Things"* - **ECCV**, 2022. (**Oral, 2.7%**)
- **Habib Slim***, Eden Belouada*, Adrian Popescu, Darian Onchis – *"Dataset Knowledge Transfer for Class-Incremental Learning without Memory"* - **WACV**, 2022.

- Eslam Mohamed, Mohamed Ayman Mohamed, Mahmoud Ahmed, **Habib Slim**, Mohamed Elhoseiny – *"CoT3DRef: Chain-of-Thoughts Data-Efficient 3D Visual Grounding"* - **Under review**, 2023.
- Christophe Brouard, Jean-Pierre Chevallet, Théo Orthlib, **Habib Slim** – *"WIB: an integrated Wikipedia browser for participatory evaluation of relevance models"* - **EGC**, 2019.

Selected Projects

ShapeWalk: Compositional Shape Editing through Language-Guided Chains

Developed ShapeWalk, a synthesized dataset for advancing compositional shape editing guided by natural language. The dataset includes unique shapes linked through edit chains, each pair associated with precise language instructions. Generated edit chains with language prompts using rule-based methods and language models. Applied the dataset to train neural editor modules, showcasing its effectiveness in language-guided 3D shape edits. Introduced multi-step editing metrics for benchmarking models' recursive shape editing capacity.

Under review.

3DCoMPaT^{++}: Large-scale 3D Vision Dataset for Compositional Recognition

Website GitHub Paper

Led the effort in advancing 3DCoMPaT into 3DCoMPaT++, a cutting-edge multimodal 2D/3D dataset. Enhanced the dataset to include 16 million rendered views of intricately detailed part-instance annotations for over 10 million stylized 3D shapes. Expanded the scope with 41 shape categories, 275 fine-grained part categories, and 293 fine-grained material classes, facilitating nuanced compositional applications to 3D objects. Integrated additional object metadata including fine-grained and coarse-grained segmentation levels and depth maps.

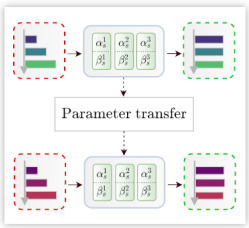
Under review at TPAMI.

3DCoMPaT: Composition of Materials on Parts of 3D Things

Website Paper

Contributed to the creation of 3DCoMPaT, a multimodal 2D/3D dataset featuring 16 million rendered views of over 10 million stylized 3D shapes with detailed part-instance annotations. Introduced the novel task of Grounded CoMPaT Recognition (GCR) to collectively recognize and ground compositions of materials on 3D object parts. Adapted state-of-the-art 2D/3D deep learning methods for this task, providing valuable baselines for future research in compositional 3D vision.

*Accepted at ECCV 2022 (**Oral**).*

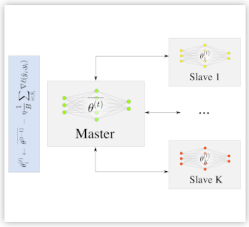


Knowledge Transfer for Memoryless Class-Incremental Learning

GitHub Paper

Focused on class-incremental learning for computer vision, a specific setting of continual learning in which image classes are split into multiple tasks sequentially learned by an agent. Worked on a novel method using both regularization and bias correction, which does not make use of a rehearsal memory. Method proposed provides consistent gains over the previous state-of-the-art baselines.

Accepted at WACV 2022.



Speeding up DNN training

GitHub Paper

Improved the training performance of deep image classifiers using simple distributed algorithms. Implemented a minimal DNN library with some basic layers (linear, dropout, activations and losses) alongside simple distributed learning algorithms, with C++, MPI and Eigen. Conducted a comprehensive evaluation of the speedups obtained on MNIST and Fashion-MNIST.

Academic Services

- Co-organized the CVPR 2023 C3DV Workshop on Compositional 3D Vision.
- Co-organized the ICCV 2023 WECIA Workshop on Emotionally and Culturally Intelligent AI.
- Reviewer for CVPR, NeurIPS.