Habib Slim

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Interests: 3D vision, compositional generation, shape editing, part understanding, part-aware generation.

Education

2023 – Today **PhD Student (3D 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
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.

Publications

- **Habib Slim**, Mohamed Elhoseiny – *"ShapeWalk: Compositional Shape Editing through Language-Guided Chains"* - **CVPR**, 2024.
- **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.

- Aymen Mir, **Habib Slim**, Faizan Farooq Khan, Jian Ding, Eslam Mohamed BAKR, Mohamed Elhoseiny – *"HuMouS: Human Motion Synthesis with Fine-Grained Control using Latent Space Manipulation of Cycle-Consistent Diffusion Models"* - **Under review**, 2024.
- 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

Part-Aware 3D Shape Editing through Layout and Feature-Level Control

Habib Slim, Mahmoud Ahmed, Mohamed Elhoseiny

Developed a novel approach for part-aware 3D shape editing leveraging part-layout priors and part-level feature representations. The method enables precise shape modifications through natural language instructions and bounding box transformations while maintaining shape identity.

Ongoing work.

ShapeWalk: Compositional Shape Editing through Language-Guided Chains

Habib Slim, Mohamed Elhoseiny

Developed ShapeWalk, a synthetic data generation method for advancing compositional shape editing guided by natural language. Generated edit chains with language prompts using shape programs, rule-based methods and language models. Applied the dataset to train latent diffusion models for language-guided 3D shape edits.

CVPR 2024.

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

Habib Slim*, Xiang Li, Yuchen Li, Mahmoud Ahmed, Mohamed Ayman, Ujjwal Upadhyay Ahmed Abdelreheem, Arpit Prajapati, Suhail Pothigara, Peter Wonka, Mohamed Elhoseiny

Led the effort in advancing 3DCoMPaT into 3DCoMPaT++, a multimodal 2D/3D dataset with 16 million rendered views of part-instance annotations for over 10 million stylized 3D shapes. Enhanced the dataset with 41 shape categories, 275 fine-grained part categories, and 293 fine-grained material classes.

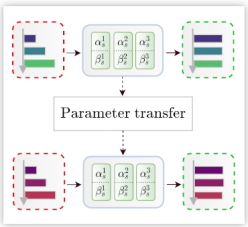
Under review, TPAMI.

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

Yuchen Li*, Ujjwal Upadhyay*, **Habib Slim***, Ahmed Abdelreheem, Suhail Pothigara, Peter Wonka, Mohamed Elhoseiny

Contributed to 3DCoMPaT, a multimodal 2D/3D dataset with 16 million rendered views of stylized 3D shapes. Introduced Grounded CoMPaT Recognition (GCR) to recognize and ground compositions of materials on 3D object parts.

ECCV 2022 - Oral.



Knowledge Transfer for Memoryless Class-Incremental Learning

GitHub Paper

Focused on class-incremental learning for computer vision, where image classes are split into multiple tasks sequentially learned by an agent. Developed a novel method using regularization and bias correction without rehearsal memory.

WACV 2022.

Academic Services

- Co-organized the CVPR 2024 C3DV, CVPR 2023 C3DV Workshops on Compositional 3D Vision.
- Co-organized the ICCV 2023 WECIA Workshop on Emotionally and Culturally Intelligent AI.
- Reviewer for CVPR (2023 - 2024), NeurIPS (2023), ECCV (2024), SIGGRAPH-ASIA (2024), CGF-Eurographics (2024).
- Teacher Assistant for "Deep Generative Modeling" (Fall 2023), "Low-Resource Deep Learning" (Fall 2024).