NTUMBA ELIE, NSAMPI

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RESEARCH STATEMENT

I am a Computer science master's student at China's Northwestern Polytechnical University. I specialize in Computer vision and Computational Photography. I am currently doing research work in Low-level vision tasks (Image enhancement, Image relighting) and High dynamic range imaging. I am also interested in problems at the intersection of computer vision, computer graphics, machine learning, and computational imaging. I am actively looking for a Ph.D. position (2022 intake) or a research internship.

EDUCATION

Northwestern Polytechnical University — Xi'an, Shaanxi, China
Master's (Ms. Eng.) in Computer Science — *August 2019 - Present*
School of Computer Science

Zhejiang Normal University — Jinhua, Zhejiang, China.
Bachelor's (B. Eng.) in Software Engineering — *September 2015- July 2019*
College of Computer Science

RESEARCH EXPERIENCE

Northwestern Polytechnical University — Xi'an, China
Computer Vision and Computational Photography Lab — *February 2020 - Present*

Group led by Dr. Qing Wang

The lab studies problems in computer vision, image processing, and computational photography. Specific research directions include Light Field image processing, Image Relighting, Novel View Synthesis, and Multi-modal machine learning.

My main responsibilities in the lab as a member of the team include the design and implementation of ideas given by either the principal investigator or by senior students, running experiments such as reproducing other methods, and comparing their results against ours. Specifics on each project are included in the projects section.

WORK EXPERIENCE

Golden Entertainment — Jinhua, China
Full-Stack Software Development — *June 2019-July 2020*

During my time as a member of the software development team, my main work included:

- The Development of the User interface for the online gaming platform.
- Translation of the design blueprints into concrete front-end code.
- The development of the platform mobile platform.
- The Development of micro-services for the database management.

PROJECTS AND PUBLICATIONS

Shadow Guided Network For Any-to-Any Relighting Role : Team Leader
CVPR 2021 NTIRE Challenge, 4th place

The goal of any-to-any relighting is to relight a given input image based on the illumination implicitly given in a guide image. In this work, we propose to solve the problem by introducing a shadow network to guide the overall relighting process. The proposed shadow network produces plausible shadows from the illumination direction inferred from the guide image via an illumination estimation network. We rank 4th on the final challenge.

Learning exposure correction via consistency modeling Role : First Author
BMVC 2021, Under Review

Given an image suffering from under or over-exposure, the exposure correction problem aims to promote such an image to a well-exposed one. We formulate the exposure correction problem as a learning problem and propose a new network architecture and training pipeline. We propose a feature loss to model exposure consistency such that images of the same content but different exposure result in the same feature representation. We achieve state-of-the-art results and outperform previous methods by a significant margin.

Physically Inspired Neural Rendering For any-to-any Relighting Role : Second Author
IEEE TIP, Under Review

We propose a new learning pipeline for any-to-any relighting by breaking the problem into sub-tasks, each solved via an independently trained network. We consider lighting effects such as attached shadows and cast shadows, based on which we propose a neural rendering approach that takes physically meaningful attributes as inputs. Our results are more realistic compared to previous works. Even in the case of occluded regions, our method is able to infer plausible geometry.

SKILLS

Programming:
Python, Matlab, LaTex

Tools:
Linux(OS), Pytorch(Deep learning), Blender(scripting)

Languages:
French (Native), English (Advanced), Chinese (Fluent).

REFERENCES

Qing Wang (Academic advisor)
Professor

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ADDITIONAL NOTE

Depending on the prospective advisor's research direction and available funding, or ongoing projects i am open to change research direction.