

Danna Xue

POSTDOCTORAL RESEARCHER

Computer Vision Center (CVC), Barcelona, Spain

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Research Interests

Computer vision; Image understanding (Image segmentation); Low-level vision (Image restoration); Color (Gamut mapping, Color editing); Domain Adaptation.

Experience

Computer Vision Center

Postdoctoral Researcher in Computer Vision

- High-fidelity color gamut mapping in smartphone ISP

Barcelona, Spain

Jul 2024 - present

Education

Computer Vision Center, Universitat Autònoma de Barcelona | Northwestern Polytechnical University

Barcelona, Spain | Xi'an, China

Ph.D. in Computer Science (GPA: 89.25/100)

Mar 2019 - Jul 2024

- Under joint supervision of **Prof. Yanning Zhang**, **Assoc. Prof. Javier Vazquez-Corral**, and **Dr. Luis Herranz**
- Passed with Cum Laude Mention and supported by the CSC scholarship

Northwestern Polytechnical University

Xi'an, China

M.Phil. in Guidance, Navigation and Control (GPA: 83.16/100)

Sep 2015 - Apr 2018

- Specialised in control theory and image processing

Northwestern Polytechnical University

Xi'an, China

B.Eng. in Detection, Guidance, and Control Technology (GPA: 87.21/100)

Sep 2011 - Jul 2015

- Specialised in Control theory and Computer Science
- Exchange in Universidad Politécnica de Madrid for 6 months supported by the CSC Scholarship

Research Experience

York University

Research stay with Prof. Michael S. Brown

Toronto, Canada

Feb 2023 - Apr 2023

- Palette-based image color manipulation (PG'23, IEEE-SPL'24)**
- Develop an intuitive, user-friendly, and content-aware framework for single and multiple image color editing.
- Leveraging color-naming for perceptual multi-image color consistency and single image color harmonization.

Computer Vision Center

Ph.D student with Dr. Javier Vazquez-Corral and Dr. Luis Herranz

Barcelona, Spain

May 2021 - Jul 2024

- Perception-distortion tradeoff for multi-image restoration (ICASSP'23)**
- Extend the perception-distortion tradeoff theory by introducing multiple-frame information.
- Propose the area of the unattainable region as a new metric for PD tradeoff evaluation.
- Analyse the performance of burst restoration under both aligned bursts and misaligned bursts situations.
- Slimmable semantic segmentation (ACM MM'22)**
- Propose an effective slimmable semantic segmentation method that can be executed at different capacities during inference.
- Design parametrized channel slimming by stepwise downward knowledge distillation for model training.

Multimedia Lab, Northwestern Polytechnical University

Ph.D student, Collaborators: Mr. Rui Li, and Ms. Pei Wang

Xi'an, China

Mar 2019 - May 2021

- Semantic aware image processing and understanding.**
- Propose a self-supervised monocular depth estimation method with semantic guidance (PR'2023).
- Propose a severe blur removal method using semantic priors. (CVIU'2024)

Micro-Satellite Lab, Northwestern Polytechnical University

Master student

Xi'an, China

Sep 2015 - Mar 2018

- Star detection and astronomical positioning in star images.**
- Propose a dim target segmentation method based on CNN model in star images (MTAP'20).
- Propose a astronomical positioning in star images based on graph matching (Patents).
- Develop an automatic satellite tracking and image capturing system based on astronomical telescope (Innovation Fund).

Publications

JOURNAL

Take a prior from other tasks for severe blur removal

Pei Wang, Yu Zhu, Danna Xue, Qingsen Yan, Jinqiu Sun, Sung-eui Yoon, Yanning Zhang

Computer Vision and Image Understanding (2024) p. 104027. Elsevier, 2024

Palette-based Color Harmonization via Color Naming

Danna Xue, Javier Vazquez-Corral, Luis Herranz, Yanning Zhang, Michael S Brown

IEEE Signal Processing Letters (2024). IEEE, 2024

Learning depth via leveraging semantics: Self-supervised monocular depth estimation with both implicit and explicit semantic guidance

Rui Li, Danna Xue, Shaolin Su, Xiantuo He, Qing Mao, Yu Zhu, Jinqiu Sun, Yanning Zhang

Pattern Recognition 137 (2023) p. 109297. Elsevier, 2023

Self-supervised monocular depth estimation with frequency-based recurrent refinement

Rui Li, Danna Xue, Yu Zhu, Hao Wu, Jinqiu Sun, Yanning Zhang

IEEE Transactions on Multimedia 25 (2022) pp. 5626–5637. IEEE, 2022

Dim small target detection based on convolutional neural network in star image

Danna Xue, Jinqiu Sun, Yaoqi Hu, Yushu Zheng, Yu Zhu, Yanning Zhang

Multimedia Tools and Applications 79 (2020) pp. 4681–4698. Springer, 2020

CONFERENCE

Integrating high-level features for consistent palette-based multi-image recoloring

Danna Xue, J Vazquez Corral, Luis Herranz, Yanning Zhang, Michael S Brown

Computer Graphics Forum, 2023

Burst perception-distortion tradeoff: analysis and evaluation

Danna Xue, Luis Herranz, Javier Vazquez Corral, Yanning Zhang

IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2023

Slimseg: Slimmable semantic segmentation with boundary supervision

Danna Xue, Fei Yang, Pei Wang, Luis Herranz, Jinqiu Sun, Yu Zhu, Yanning Zhang

ACM International Conference on Multimedia (ACMMM), 2022

PREPRINT

Synth-to-Real Unsupervised Domain Adaptation for Instance Segmentation

Yachan Guo, Yi Xiao, Danna Xue, Jose Luis Gomez Zurita, Antonio M López

arXiv preprint arXiv:2405.09682 (2024). 2024

Patents

No. 201810340376.5 A method for extracting weak targets from single-frame star images based on CNN

No. 201718001621.6 A Star Extraction Method Based on Space and Frequency Features

No. 201718001620.1 A Star Image Labeling Method Based on Graph Matching Application

No. 201618001078.5 A Star Image Matching and Motion Parameters Estimation Method Application

Academic Services

Conference Review ECCV (2024), WACV (2023), ACM MM (2023, 2024).

Journal Review Pattern Recognition; IEEE Transactions on Geoscience and Remote Sensing.

Program Committee Session Chair, CVCR&D 2024; Poster Session Chair, ACMCV 2024.

Honors

2019 **First Class Scholarship**, PhD Student

NWPU, China

2016 **Graduate Student Innovation Fund**, 20,000CNY

NWPU, China

2012 **First Prize**, Mathematical Contest in Modeling

NWPU, China

Skills

Programming Python (PyTorch, Tensorflow, NumPy, Scikit-learn, Pandas, Colour, Matplotlib, etc.), MATLAB.

Miscellaneous Linux, Shell, \LaTeX (Overleaf/R Markdown), Microsoft Office, Git.

Language **Mandarin** (Native), **English** (Professional, C1 level), **Spanish** (Elementary).