# Muxingzi LI

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## SUMMARY

*An intellectually curious and self-driven problem solver with a strong mathematical background, as well as hands-on experience in various projects. Featured on the CVPR Daily.*

## EDUCATION

*2018 - 2021* | *France*

***PhD in Automation, Signal and Image Processing*** — INRIA

INRIA (in association with Université Côte d'Azur)
Supervised by Prof. Florent Laforge

*2015 - 2017* | *Saudi Arabia*

***M.Sc. in Applied Mathematics and Computational Science*** — KAUST

Visual Computing Center, King Abdullah University of Science and Technology
Supervised by Prof. Wolfgang Heidrich, GPA: 3.93/4.0
General Secretary at ACM Student Chapter

*2012 - 2015* | *UK*

***B.Sc in Mathematics (2:1)*** — University of Oxford

Exeter College, University of Oxford
2014 Met Office Academic Partnership summer intern at the Physics Department

## PROJECT HIGHLIGHTS

*12/2020 - 01/2021* | *Hangzhou, China*

***Image Enhancement*** — Alibaba DAMO Academy

- Internship project at the City Brain Lab, Alibaba DAMO Academy
- Designed a novel model based on Conditional GAN for low-light image enhancement with unpaired learning. All work finished within 1.5 months with a submitted paper

*08/2020 - 12/2020* | *Hangzhou, China*

***3D change detection*** — Alibaba DAMO Academy

- Internship project at the City Brain Lab, Alibaba DAMO Academy
- Developed an algorithm for locating changes between a 3D scene at time t0 and input images collected from time t1, based on differentiable rendering. Implemented in Pytorch3D

*05/2019 - 03/2020* | *France*

***3D registration*** — INRIA

- 3D point-to-model rigid registration with an unknown relative scale
- Designed a novel initialization approach based on surface-normal distributions, and an iterative optimization method integrating scale estimation. Implemented with CGAL and Ceres

*04/2018 - 03/2019* | *France*

***Object polygonalization*** — INRIA

- A geometry processing project on polygonal approximation in images
- Designed deterministic and stochastic optimization schemes for a discrete optimization problem. Outperformed the state-of-the-art methods by 2-6% in terms of accuracy. Applied the pipeline for vectorization of floormap images

*07/2017 - 03/2018* | *Saudi Arabia*

***Computational photography*** — KAUST

- A project on dual-camera denoising
- Developed an algorithm for fusing images captured by a dual-lens camera in low light, outperforming the state-of-the-art by 2-5% in terms of signal-to-noise ratio
- Supervised an undergraduate intern on optical flow artifacts detection

*10/2017 - 02/2018* | *Saudi Arabia*

***Biological image analysis*** — KAUST

- A cross-disciplinary project in collaboration with an Environmental Engineering team
- Designed a novel pipeline for automatic cleaning and segmentation of biomedical images. Software currently in use at Water Desalination and Reuse Center in KAUST

*07/2014 - 09/2014* | *UK*

***Climate data analysis*** — University of Oxford

- Internship in collaboration between University of Oxford and University of Reading
- Analyzed historical climate data to reveal relation between cyclones and climate change via Monte Carlo simulation. Publication in a high-impact journal as the first author

## SKILLS

- ***Technical***: C++, Python, Pytorch, PyTorch3D, 3D Vision, Geometry Processing
- ***Languages***: English, Mandarin
- ***Reviewer***: TPAMI, Optics Express, IEEE Transactions on Medical Imaging
- ***Sports***: PADI Advanced Open Water Driver

## PUBLICATIONS

1 M. Li, F. Lafarge, **Planar Shape Based Registration for Multi-modal Geometry**. *British Machine Vision Conference (BMVC), 2021*

2 X.Sun*, M. Li*+, T. He, L. Fan, **Enhance images as you like with unpaired learning**. *International Joint Conference on Artificial Intelligence (IJCAI), 2021*

3 M. Li, F. Lafarge, R. Marlet, **Approximating shapes in images with low-complexity polygons**. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2020* **[Oral]**

4 M. Li*,P. Tu*, W. Heidrich, **Robust joint image reconstruction from color and monochrome cameras**. *British Machine Vision Conference (BMVC), 2019*

5 L. Fortunato, M. Li, T. Cheng, Z. U. Rehman, W. Heidrich, T. Leiknes, **Cake layer characterization in Activated Sludge Membrane Bioreactors: Real-time analysis,**. *Journal of Membrane Science, 2019*

6 M. Li, R. Idoughi, B. Choudhury, W. Heidrich, **Statistical model for OCT image denoising**. *Biomedical Optics Express, 2017*

7 M. Li, T. Woollings, K. Hodges, G. Masato, **Extratropical cyclones in a warmer, moister climate: A recent Atlantic analogue**. *Geophysical Research Letters, 2014*