



# Chen Yifeng

Major

Civil Engineering and Data Science

École Polytechnique Fédérale de Lausanne

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## PUBLICATION

- Nils Olsen, **Yifeng Chen**, Pascal Turberg, Alexandre Moreau, Alexandre Alahi, X-ray Micro-CT based characterization of rock cuttings with deep learning, *Applied Computing and Geosciences*
- Jiayao Chen, **Yifeng Chen**, Anthony G. Cohn, Hongwei Huang, Jianhong Man, Lijun Wei, A novel image-based approach for interactive characterization of rock fracture spacing in a tunnel face, *Journal of Rock Mechanics and Geotechnical Engineering*
- Liangfu Ge, Danhui Dan, Ki Young Koo, **Yifeng Chen**, An improved system for long-term monitoring of full-bridge traffic load distribution on long-span bridges, *Structures*

## WORKING EXPERIENCE

### • Junior computer vision engineer

Nov. 2024 - Mar. 2025

Mentor: *Taylor Mordan*

Mobilysis, Lausanne

- Applying and modifying the tracking-related algorithm (**Strongsort**) to strengthen the consistency of the trajectories of the vehicle or pedestrian in urban environment using drone dataset

### • Computer vision software development internship

Jan. 2024 - Apr. 2024

Mentor: *Dengfeng Cao*

Hello TransTech, Hangzhou

- Leading **AI alignment** tasks for several computer vision projects such as video quality assessment, action recognition, facial emotion recognition, video information retrieval and video matting
- Implementing **Yolo v8** method and writing vehicle algorithm to guarantee the correctness and truthfulness of the upload photos from each user, and apply such algorithm to tackle the problem in real scenario

## RESEARCH EXPERIENCE

### – Road, Lane Segmentation and On-street Parking Analysis on the Drone Dataset

Apr. 2024 - Sep. 2024

Advisor: *Nikolas Geroliminis*

EPFL, LUTS, Lausanne

- \* Using open source satellite images as prior, applying feature matching (**LightGlue**), image segmentation(**EfficientSAM**) and post-processing method to segment roads based on drone dataset.
- \* Using vehicles' positions and nearby vehicles' relative spatial relationship as prior, predicting lanes' area.
- \* Analysing the on-street parking efficiency based on previous result.

### – Micro CT characterization of rock cuttings with Deep Learning

Sep. 2023 - Dec. 2023

Advisor: *Pascal Turberg, Alahi Alexandre*

EPFL, PIXE, Lausanne

- \* Implementation of supervised **ResNet-18** model with transfer learning for rock cuttings classification.
- \* Contribute to writing of a journal article which is submitted to **Applied Computing and Geosciences**

### – Generating Occlusion-free Vehicle Images from the Drone Dataset

Sep. 2022 - Feb. 2023

Advisor: *Nikolas Geroliminis*

EPFL, LUTS, Lausanne

- \* Create a unique occluded vehicle image training dataset based on the Drone dataset.
- \* Modify the mask implementation, train the **context encoder** network and restore the image from occluded vehicle image dataset, compare the prediction results and ground truth qualitatively and calculate the SSIM metrics.

### – Open Loop and Closed Loop Trajectory Planning

Sep. 2022 - Feb. 2023

Advisor: *Alahi Alexandre*

EPFL, VITA, Lausanne

- \* Based on **nuPlan** framework and dataset, design, train and simulate trajectory planner and agents based on 3 ML-based planners(**Raster model**, **LaneGCN model** and **Visual Transformer model**)
- \* Visualize planners, and compare different planners based on open and closed loop metrics

### – Noise emissions using trajectories from a swarm of drones

Feb. 2022 - Jun. 2022

Advisor: *Nikolas Geroliminis*

EPFL, LUTS, Lausanne

- \* Analyze and visualize the effect of acceleration, velocity, and type of vehicle towards the noise from each vehicle as well as from each road on the **Pneuma** dataset which contains half a million vehicle trajectories information.
- \* Obtaining the results that noise variation of each road has a periodic pattern.

### – A novel image-based approach for interactive characterization of rock fracture

Feb. 2021 - Jul. 2021

Advisor: *Hongwei Huang*

Tongji University, Shanghai

- \* Applied **FraSegNet model** with **Atrous spatial pyramid pooling module** for fracture information detection
- \* Digitized each fracture image to chain code and coordinate, determine the key nodes based on **polyline fitting** method
- \* Designed interactive measurements of rock parameters; Contribute to the writing of a journal article which has been accepted by **Journal of Rock Mechanics and Geotechnical Engineering**

- An improved system for full-bridge traffic load distribution on long-span bridges      *Feb. 2020 - Feb. 2021*  
*Advisor: Danhui Dan*      Tongji University, Shanghai  
\* Applied **Yolo v4** model for multiple vehicles detection in bridge  
\* Proposed a dual-metric vehicle tracking strategy that combines the motion and appearance features of vehicles to address the problem of vehicle occlusion.  
\* Coordinate transformation from image to bridge coordinates; Contribute to the coding of a journal article which has been accepted by **Structures**

## SELECTED COURSE PROJECTS

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- An interactive journey through GHG emissions      *Feb. 2023 - Jun. 2023*  
*Course project of Data visualization*      Instructor: Laurent Vuillon  
\* Data exploration and analysis through Jupyter notebook  
\* Apply **geojson** to create an interactive worldmap based on worldwide GHG emission datatset
- Robust journey planning      *Feb. 2023 - Jun. 2023*  
*Course project of Large-scale data analysis*      Instructor: Cyril Matthey-Doret  
\* Constructing transportation network by using SBB istdaten dataset  
\* Building a route planner based on travel time and delay  
\* Visualizing the planned routes by ipywidgets
- Robots programmed to follow you      *Feb. 2022 - Jun. 2022*  
*Course project of Deep learning for autonomous vehicles*      Instructor: Alahi Alexandre  
\* Labeled the images, implemented and trained **Yolo v5s** to detect the target  
\* Applied the **Deep Sort** algorithm to track the target in real-time  
\* Implemented the algorithm on the Loomo robot and achieved **the first prize** among 20 teams
- Noise2Noise model implementation      *Feb. 2022 - Jun. 2022*  
*Course project of Deep learning*      Instructor: François Fleuret  
\* Implemented and trained **U-network** to denoise plenty of target images  
\* Implemented the deep learning modules included **Convolutional layer**, **Upsampling layer**, **Sequential module**, **L2 loss function** and so on by using basic library and torch.empty

## EDUCATION

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- École Polytechnique Fédérale de Lausanne(EPFL)      *Sep. 2024 - Sep. 2021*  
*Major: Civil Engineering/Minor: Data science(MSc)*      Grade: 5.34/6
- Tongji University      *Sep. 2016 - Jul. 2021*  
*Major: Civil Engineering/Minor: Mathematics and Applied Mathematics(BSc)*      Grade: 4.46/5
- The Hong Kong Polytechnic University (PolyU)      *Aug. 2019*  
*Summer School on Civil Engineering*      Visiting student
- Korea Institute of Advanced Science and Technology (KAIST)      *Aug. 2018*  
*The 12th KAIST-TONGJI Symposium on Civil Engineering*      Visiting student

## TECHNICAL SKILLS

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- **Programming:** Python, Matlab, Javascript, Ansys, Plaxis, AutoCAD, Blender
- **Tools & OS:** Jupyter Notebook, Google Colab, linux OS, mac OS
- **Libraries/Frameworks:** Pandas, Numpy, Scikit-learn, Pytorch, OpenCV, networkx, Spark...

## INTERESTS

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Photography, Swimming, Badminton, Video, making, Heartstone (Rank top 300 in China), Music

## LANGUAGE

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Mandarin (native), English (Tofel:98, best score:100, GRE:322), French: B1, German: A1