

# Yist YU

✉ [tingyang.yu@epfl.ch](mailto:tingyang.yu@epfl.ch) | ☎ +41 21 693 31 77 | ⚙️ <https://yistryu.github.io/>

## EDUCATION

---

### École Polytechnique Fédérale de Lausanne (EPFL)

Sep. 2023 – Sep. 2027 (expected)

*Ph.D. in Communication and Computer Sciences (EDIC)*

Lausanne, Switzerland

- EDIC Computer Science Fellowship Recipient (Direct Doctorate).
- Advised by Prof. Maria Brbic at the Machine Learning for Biomedicine (MLBio) Lab.
- Engage in the advanced development of machine learning and AI models, focusing on single-cell analysis, including gene expression profiles, multi-omics data, and spatial transcriptomics, to extract critical biological insights.

### The Chinese University of Hong Kong (CUHK)

Aug. 2019 – July 2023

*B.Sc. in Mathematics and Information Engineering (MIEG) With Honours, First Class*

Hong Kong SAR, China

- Ranked among the **top 3** students among MIEG students admitted in 2019-20. (Exact rank is unavailable for students)
- **Winter semester exchange program in Faculty of Applied Science & Engineering, University of Toronto (UoT), 2021-22.**
- Ranked **top 0.4%** among **163,000** science students in the National College Entrance Exam.

## PUBLICATIONS AND PREPRINTS

---

### 2024

1. **Generating complex tissue structures from gene expressions with LUNA**  
Tingyang Yu, Chanakya Ekbote, Nikita Morozov, Stéphane d'Ascoli, Jiashuo Fan, Pascal Frossard, and Maria Brbić.  
*Preprint 2024 (In preparation) (Abstract Accepted at Single Cell Genomics 2024)*
2. **Fool Your (Vision and) Language Model With Embarrassingly Simple Permutations.** [paper]  
Yongshuo Zong, Tingyang Yu, Bingchen Zhao, Ruchika Chavhan, and Timothy Hospedales.  
*International Conference on Machine Learning (ICML) 2024*
3. **Safety Fine-Tuning at (Almost) No Cost: A Baseline for Vision Large Language Models.** [paper]  
Yongshuo Zong, Ondrej Bohdal, Tingyang Yu, Yongxin Yang, and Timothy Hospedales.  
*International Conference on Machine Learning (ICML) 2024*
4. **SCMBench: Benchmarking Domain-specific and Foundation Models for Single-cell Multi-omics Data Integration**  
Yixuan Wang, Yimin Fan, Xuesong Wang, Tingyang Yu, Yongshuo Zong, Xinyuan Liu, Meitong Liu, Qing Li, Kin hei Lee, Khachatur Dallakyan, Gengjie Jia, Jiao Yuan, Ting-Fung Chan, Xin Gao, Irwin King, and Yu Li.  
*Preprint 2024 (In preparation)*

### 2021-2023

1. **Contrastive Cycle Adversarial Autoencoders for Single-cell Multiomics Alignment and Integration** [paper]  
Xuesong Wang, Zhihang Hu, Tingyang YU, Ruijie Wang, Yumeng Wei, Juan Shu, Jianzhu Ma, Yu Li  
*Bioinformatics 2023*
2. **scMinerva: an Unsupervised Graph Learning Framework with Label-efficient Fine-tuning for Single-cell Multi-omics Integrative Analysis** [paper]  
Tingyang Yu, Yongshuo Zong, Yixuan Wang, Xuesong Wang, Yu Li.  
*bioRxiv Preprint 2022 (Major revision at Advanced Science)*
3. **conST: an interpretable multi-modal contrastive learning framework for spatial transcriptomics** [paper]  
Yongshuo Zong, Tingyang YU, Xuesong Wang, Yixuan Wang, Zhihang Hu, Yu Li  
*bioRxiv Preprint 2021 (Major revision at Nucleic Acids Research)*

## RESEARCH EXPERIENCE

---

### Subgraph Augmentation for Graph Neural Networks

Sep. 2022 – May, 2023

*Final year project supervised by Professor Irwin King (CUHK)*

Hong Kong SAR, China

- Conducted thorough experiments which showed that this strategy outperformed state-of-the-art sampling strategies published at ICLR 2022 on graph classification by 3% on TU datasets. It further reduced the space complexity up to 55% on dataset IMDB-MULTI and 10-20% training time on dataset NCI1 compared to the second best strategy.

## Projection Robust Unbalanced Optimal Transport

Feb. 2022 – Dec. 2022

Research Assistant to Professor Ma Shiqian (University of California, Davis)

California, USA

- Presented a new model called projection robust unbalanced optimal transport (PRUOT) to alleviate the curse of dimensionality for computing the Wasserstein distance between unbalanced distributions.
- Illustrated a Riemannian optimization algorithm RGAS-UOT for solving this new model and proved its non-trivial finite-time convergence guarantee to obtain the stationary point. Numerical experiments were given to demonstrate the advantages of the PRUOT model in high-dimensional cases. **The work was presented in this report.**

## Single-cell Multi-omics Integration with Random Walk and Graph Neural Network

April, 2021 – Sep., 2023

Research Assistant to Professor Li Yu (CUHK)

Hong Kong SAR, China

- Presented *scMinerva*, an unsupervised Graph Convolutional Network framework for single-cell multi-omics integration, which featured a novel algorithm *omics2vec* that enabled random walk algorithm for heterogeneous graphs.
- *scMinerva* achieved superior classification performance among 7 state-of-the-art methods on 6 real-world datasets and improved classification accuracy up to 20% on dataset GSE128639 when classifying to 27 classes.
- Won the Best Project Award for Summer Research Internship of CUHK, 2020-21 (**Top 10% out of 46 projects**).

## Zyablov Bound on General Adversarial Various Channels

June, 2020 – Sep. 2020

Research Assistant to Professor Sidharth Jaggi (CUHK)

Hong Kong SAR, China

- Worked on extending Zyablov Bound which is based on concatenated code to the general adversarial various channels.
- Revisited the basic assumptions for classic Zyablov Bound from coding theory and information theory and examined them from classic channels to general adversarial various channels, which are more practical in real-life transmissions.

## ACADEMIC AWARDS AND SCHOLARSHIPS

---

EDIC Computer Science Fellowship (54,000 CHF), 2023-24;	<i>EDIC, EPFL</i>
Academic Excellence Scholarship for Non-local Students (30,000 HKD), 2022-23;	<i>Faculty of Science, CUHK</i>
Professor Charles K. Kao Exchange Scholarship (50,000 HKD), 2021-22;	<i>The Charles K. Kao Foundation</i>
Dean's List (Top 10%) of 2019-20, 2020-21, 2022-23;	<i>CUHK</i>
ELITE Stream Scholarship (20,000 HKD) of 2019-20, 2020-21;	<i>ELITE Stream</i>
IE Award for Academic Exchange (30,000 HKD), 2021-22;	<i>Dept. of Information Engineering, CUHK</i>
Best Project Award for Summer Research Internship of CUHK, 2020-21;	<i>Faculty of Engineering, CUHK</i>
Morningside Academic Scholarship (10,000 HKD) of 2020-21;	<i>Morningside College</i>
Master's List of 2019-20, 2020-21, 2022-23;	<i>Morningside College, CUHK</i>
Morningside Admission Scholarship (12,000 HKD) of 2019-20;	<i>Morningside College</i>
Second Prize in National Physics Competition for Senior High, 2018-19;	<i>National Physics Competition Committee</i>
Second Prize in National Mathematics Competition for Senior High, 2018-19.	<i>Chinese Mathematics Society</i>

## ACADEMIC SERVICES

---

Student Organizer and Program Chair for NeurIPS 2024 AIDurgX Workshop.

Reviewer for RECOMB 2024 (1 paper), ICLR MLGenX Workshop (2 papers), NeurIPS 2024 AIDurgX Workshop (6 papers).

## COMMUNITY CONTRIBUTIONS

---

### Women in IC

Sep. 2023 - Present

Committee Member

Lausanne, Switzerland

- Organize seminars and workshops, providing platforms for female researchers and engineers in communication and computer sciences to share their experiences and inspire others.
- Pioneered the design of the organization's first logo, encapsulating themes of gender equality and social justice.

### Project Nous

May 2023 - August 2023

Seminar leader and Contributor

Harbin, China

- Brought liberal arts education and seminar-style learning to students from Harbin, China. Develop a 30-hour seminar series with ten sessions titled as *Understanding sets us free: modern society from the view of gender study*.
- Guided 14 high school students and undergraduate students through gender study and civic engagement activities. Encouraged discussion in seminars to think critically and forge connections between the self and the community.

## Hong Kong Dog Rescue

*Part-time Volunteer*

Jan. 2023 - Mar. 2023

Hong Kong SAR, China

- Clean the dog kennels, attend to dogs with health issues, invigorate and promote socialization among the 600 dogs of the Tai Po Homing Center.
- Help to facilitate Homing Center visits and advertise the work of HKDR with the objective of enhancing the understanding of dogs in Hong Kong and reducing the instances of pet abandonment.

## “WOMEN US” Girl Empowerment Project

*Founder and Contributor*

Feb. 2021 – Feb. 2022

Mainland, China

- Initiated the “WOMEN US” Girl Empowerment project, a mainland China based non-profit self-empowerment project for female high school students that provides reading material on the power of women to broaden their horizons.
- Collaborated with Fudan University’s iGEM team to introduce their projects to the students of No.1 Middle School in Qinghai Province to introduce the story of female scientists and germinate youth interest in STEM.
- Developed a WeChat mini-program to connect high-school students with undergraduates from diverse disciplines.

## SANGCHU Marmots Youth Hostel

*Full-time Volunteer*

June, 2021 – July, 2021

Gannan Tibetan Autonomous Prefecture

- Worked on the daily affairs of the hostel, including cleaning, cooking, and social media advertisements.
- Participated in marmot protection activities, infectious diseases management and population control. Provided local and social culture immersion tours for international tourists.

## LEADERSHIP EXPERIENCE

---

### Mandarin Debate Team of CUHK

*Captain and Team Member*

Sep. 2019 – May, 2021

Hong Kong SAR, China

- Prepared over 9 hours of weekly debate training material for 120+ team members and handled logistics for team registration and participation in 10+ international competitions.
- Launched the team PR group to advertise the competition results and liaise with other parties for collaborations. Fund-raised over 30,000 CNY from corporate sponsors for international competition trips and debate visits.

### Exemplar Tournament Freshman Mandarin Debate Competition

*Founder and Contributor*

Mar. 2021 – May, 2021

Hong Kong SAR, China

- Founded the "Exemplar Tournament" Freshman Mandarin Debate Competition as the first international Mandarin debate competition initiated by CUHK. The competition received more than 14,000 HKD as funding from CUHK.
- Drafted the Tournament Regulations, resolved multiple emergencies during the 2-month competition period, and organized team registration for more than 50 universities and debate clubs all over the world.

## EXTRA-CURRICULUM AWARDS

---

### 2020 HANGZHOU Mandarin Debate Grand Prix (256 teams)

*“Best Debater Award Among All the Teams” in Hong Kong area.*

Jan. 2020 - Mar. 2020

Virtual

### The 1st FENGYE Cup Mandarin Debate Competition (32 teams)

*Champion; “Best Debater Award for the Competition”.*

Mar. 2020 - May, 2020

Virtual

### The Thirteenth XINWEI-HUAXIA Mandarin Debate World Cup (48 teams)

*“Best Debater Award for the Competition”.*

Sep. 2020

The University of New South Wales

## SKILLS & MISC.

---

- *Language* English (professional), Mandarin (native), Cantonese (fluent).
- *Programming* Matlab, Java, C, R, Python {Pytorch, Tensorflow, NetworkX, Pandas, Numpy, sklearn}.
- *Tools* L<sup>A</sup>T<sub>E</sub>X, Linux, Anaconda, Git, MongoDB, Docker, WanDB, Abode Illustrator.
- *Hobbies* Writing, swimming, running, bodybuilding, etc.