CURRENT RESEARCH INTERESTS	☐ Machine Learning☐ Matrix/Tensor Computations☐ Low-Rank Models	 □ Spatiotemporal Data Modeling □ Missing Data Imputation □ Time Series Analysis 	☐ Intelligent Transportation☐ Smart Cities☐ Human Mobility			
Contact Information	chenxy346@gmail.com https://xinychen.github.io (homepage) xinychen chenxy346 Google Scholar 7 744 citations (h-index: 10 & i10-index: 10)					
BIOGRAPHY	In Summer 2023 (or thereafter), I will finish my PhD at University of Montreal (UdeM), with support from the IVADO PhD Excellence Scholarship and the CIRRELT PhD Excellence Scholarship. My PhD research focuses on machine learning, spatiotemporal data modeling, and intelligent transportation systems.					
EDUCATION	PhD in Civil Engineering (Transportation) Polytechnique Montreal, University of Montreal Nontreal, Canada VIVADO PhD Excellence Scholarship & CIRRELT PhD Excellence Scholarship Thesis: Spatiotemporal Traffic Data Imputation and Forecasting with Low-Rank Models Advisor: Nicolas Saunier (full professor at Polytechnique Montreal) Co-advisor: Lijun Sun (associate professor at McGill University)					
	Master's degree in Traffic Information Engineering & Control ☐ Sun Yat-Sen University ☐ Outstanding Thesis Award (top 2% in total) ☐ Thesis: Imputing Spatiotemporal Missing Traffic Data by Bayesian Tensor Factorization Models ☐ Advisor: Zhaocheng He (full professor) ☐ Bachelor's degree in Traffic Engineering ☐ Guangzhou University ☐ Coungzhou, China ☐ Guangzhou University ☐ Coungzhou, China					
	 Thesis: Modeling Vehicles' Time Headway with Log-Normal and Power-Law Distribution Advisor: Xiaodong Zang (full professor) 					
Honours and Awards	 CIRRELT PhD Excellence Scholar IVADO PhD Excellence Scholar Outstanding Thesis Award (by Sometiment) National Scholarship (by Ministra) 	ship (\$100,000, by Institute for Dat Sun Yat-Sen University)	2021.3 a Valorisation) 2020.0 2019.0 2018.3			
Refereed Journal Papers	Google Scholar: https://scholar.google.com/citations?user=mCrW04wAAAAJ&hl ◆ First-author papers (3 papers cited above 100 times) 7. Xinyu Chen, Lijun Sun (2022). Bayesian temporal factorization for multidimensional time series prediction. IEEE Transactions on Pattern Analysis and Machine Intelligence. 44 (9): 4659-4673. bhttps://doi.org/10.1109/TPAMI.2021.3066551					
	 JCR-Q1 IF: 24.314					

 \clubsuit JCR-Q1 \blacksquare IF: 9.551 \blacksquare top-tier \spadesuit ESI hot paper (top 0.1%)

https://doi.org/10.1109/TITS.2021.3113608

5. Xinyu Chen, Yixian Chen, Nicolas Saunier, Lijun Sun (2021). Scalable low-rank tensor learning for spatiotemporal traffic data imputation. *Transportation Research Part C: Emerging Technologies*. 129: 103226.

4. Xinyu Chen, Jinming Yang, Lijun Sun (2020). A nonconvex low-rank tensor completion model for spatiotemporal traffic data imputation. *Transportation Research Part C: Emerging Technologies*. 117: 102673.

3. Xinyu Chen, Zhaocheng He, Yixian Chen, Yuhuan Lu, Jiawei Wang (2019). Missing traffic data imputation and pattern discovery with a Bayesian augmented tensor factorization model. *Transportation Research Part C: Emerging Technologies*. 104: 66-77.

```
https://doi.org/10.1016/j.trc.2019.03.003
$ | ICR-Q1 | ■ | IF: 9.022 | Q | top-tier
```

2. Xinyu Chen, Zhaocheng He, Lijun Sun (2019). A Bayesian tensor decomposition approach for spatiotemporal traffic data imputation. *Transportation Research Part C: Emerging Technologies*. 98: 73-84.

```
    https://doi.org/10.1016/j.trc.2018.11.003
    JCR-Q1
    IF: 9.022
    top-tier
    200+ citations
    ESI highly cited paper (top 1%)
```

1. Xinyu Chen, Zhaocheng He, Jiawei Wang (2018). Spatial-temporal traffic speed patterns discovery and incomplete data recovery via SVD-combined tensor decomposition. *Transportation Research Part C: Emerging Technologies.* 86: 59-77.

- **♦** Co-author papers
- 3. Lijun Sun, Xinyu Chen, Zhaocheng He, Luis F. Miranda-Moreno (2021). Routine pattern discovery and anomaly detection in individual travel behavior. *Networks and Spatial Economics*. 35.

```
http://dx.doi.org/10.1007/s11067-021-09542-9
```

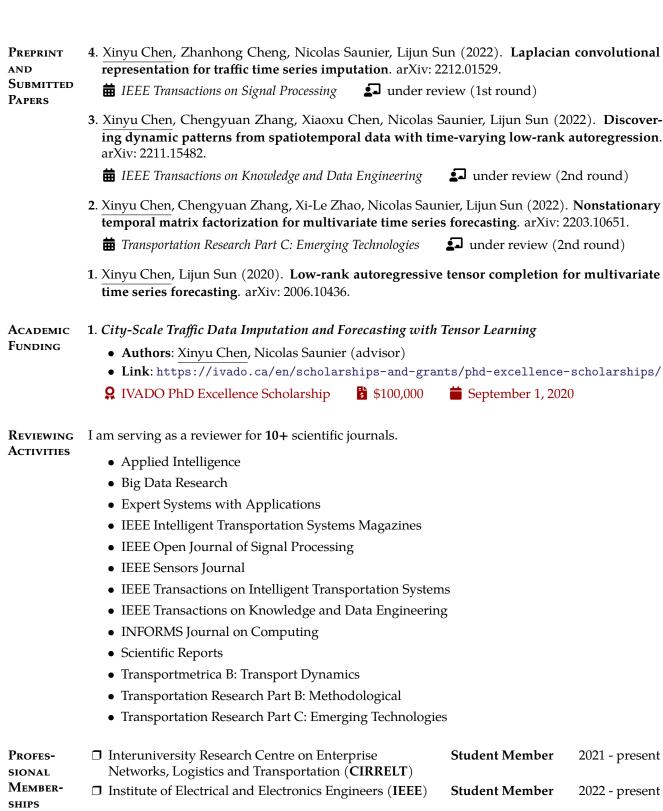
2. Pu Ren, Xinyu Chen, Lijun Sun, Hao Sun (2021). Incremental Bayesian matrix/tensor learning for structural monitoring data imputation and response forecasting. *Mechanical System and Signal Processing*. 158: 107734.

```
https://doi.org/10.1016/j.ymssp.2021.107734
$ ICR-Q1
IF: 8.934
```

1. Zhaocheng He, Kaiying Chen, Xinyu Chen (2018). A collaborative method for route discovery using taxi drivers' experience and preferences. *IEEE Transactions on Intelligent Transportation Systems*. 19 (8): 2505-2514.

CONFERENCE TRB 2023: Xinyu Chen, Chengyuan Zhang, Lijun Sun, Nicolas Saunier (2023). Nonstationary
Papers temporal matrix factorization for sparse traffic time series forecasting. The 102nd Annual Meeting
of Transportation Research Board.

KDD Time Series Workshop: Xinyu Chen, Mengying Lei, Nicolas Saunier, Lijun Sun (2021). **Low-rank autoregressive tensor completion for spatiotemporal traffic data imputation**. *The 7th SIGKDD Workshop on Mining and Learning from Time Series* (*MiLeTS*).



Memberships

Institute of Electrical and Electronics Engineers (IEEE) Student Member 2022 - present

OpenSource
Projects

I am leading some innovative projects on GitHub (3.3k+ stars & 600+ forks & 450+ followers).

Selected repositories

transdim: Python codes for spatiotemporal data imputation and prediction using a variety of state-of-the-art machine learning (mainly including low-rank matrix and tensor methods) and deep learning models.

xinychen/transdim \$\frac{1}{2}\$ 950+ stars

	ଚ	awesome-LaTeX-drawing : Drawing Bayesian networks, graph tensor structures, and technical frameworks in LaTeX. (Most efrom our research papers.)		19.06 - present			
		xinychen/awesome-latex-drawing					
	0	LaTeX-cookbook : Academic writing with LaTeX: A tutorial (i	n Chinese). 20	21.05 - present			
		🕥 xinychen/latex-cookbook 💢 700+ stars					
	9	awesome-beamer : Creating presentation slides by using Beam (Most examples are from our research.)	ner in LaTeX. 20	20.11 - present			
		🗘 xinychen/awesome-beamer 🕏 60+ stars					
	9	tracebase : Multivariate time series forecasting on high-dimer sparse Uber movement speed data.	nsional and 20	20.11 - present			
	xinychen/tracebase \$\frac{1}{12}\$ 30+ stars						
Presenta-		Low-rank matrix and tensor methods for spatiotemporal traff	fic data modeling	g. 2023.05			
tion & Talk	Southern University of Science and Technology K						
		• Slides: https://xinychen.github.io/slides/traffic_data_modeling_v1.pdf					
	\square Low-rank matrix and tensor methods for spatiotemporal data modeling.						
	Sichuan University Harimanita of Florida and Tankanda and China						
	University of Electronic Science and Technology of ChinaSlides: https://xinychen.github.io/slides/stdata_modeling.pdf						
		☐ Low-rank matrix and tensor factorization for speed field reconstruction. 2023.03					
	 Research Group of Transport, Polytechnique Montreal Slides: https://xinychen.github.io/slides/MF_TF_SFR.pdf 						
		Spatiotemporal traffic data imputation and forecasting with tensor learning. 2022.05					
		• IVADO Project Workshop					
	 Slides: https://xinychen.github.io/slides/phd_project_22summer.pdf Nonstationary temporal matrix factorization for multivariate time series forecasting. 2022.0 Hong Kong Machine Learning Meetup (virtual) Slides: https://xinychen.github.io/slides/notmf.pdf Bayesian temporal factorization for multidimensional time series prediction. 2021.0 						
	 IFT 6760A Course (Matrix and tensor factorization techniques for machine learning) Slides: https://doi.org/10.5281/zenodo.4693404 						
Blog Posts	BLOG POSTS I enjoy writing some blog posts about my research (30+ posts & 70k+ views & 300+ followers or Medium). M https://medium.com/@xinyu.chen						
	♦ S	elected posts					
	5.	Temporal matrix factorization for multivariate time series forecasting.	5k+ views	2022.03.20			
	4.	Reduced-rank vector autoregressive model for high-dimensional time series forecasting.	4k+ views	2021.10.16			
	3.	Dynamic mode decomposition for multivariate time series forecasting.	16k+ views	2021.10.10			
	2.	Matrix autoregressive model for multidimensional time series forecasting.	8k+ views	2021.10.03			
	1.	Intuitive understanding of randomized singular value decomposition.	9k+ views	2020.07.01			

☐ **Expertise**: Python/Matlab/Julia/R/Java; NumPy/PyTorch/Cupy; Jupyter Notebook; LaTeX; CSS/HTML.

References Please reach out to request a reference letter.

Prof. Nicolas Saunier (advisor)

- Full Professor
- Département des génies civil, géologique et des mines (CGM)
- Polytechnique Montréal
- CIRRELT, RRSR, CIRODD & IVADO
- Homepage: http://n.saunier.free.fr/saunier/
- Email: nicolas.saunier@polymtl.ca

Prof. Lijun Sun (co-advisor)

- Associate Professor
- Department of Civil Engineering
- McGill University
- Homepage: https://lijunsun.github.io
- Email: lijun.sun@mcgill.ca

Prof. Xi-Le Zhao (collaborator)

- Full Professor
- School of Mathematical Science
- University of Electronic Science and Technology of China
- Homepage: https://zhaoxile.github.io
- Email: xlzhao122003@163.com