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. xinychen chenxy346 Google Scholar 7721 citati	io (homepage) ons (h-index: 10 & i10-index: 10)				
Biography	In Summer 2023, 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 (assistant 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 Ten 		ol 2016.08 - 2019.06 Guangzhou, China			
	 Advisor: Zhaocheng He (full professor) Bachelor's degree in Traffic Engineering Guangzhou University Thesis: Modeling Vehicles' Time Headway with Log-Normal and Post Advisor: Xiaodong Zang (full professor) 		2012.09 - 2016.06 Guangzhou, China wer-Law Distribution			
Honours and Awards	 CIRRELT PhD Excellence Schola IVADO PhD Excellence Schola Outstanding Thesis Award (by National Scholarship (by Ministra) 	rship (\$100,000, by Institute for Dat Sun Yat-Sen University)	2021.12 ta Valorisation) 2020.04 2019.06 2018.11			
Refereed Journal Papers	 Google Scholar: https://scholar.google.com/citations?user=mCrW04wAAAAJ&hl First-author papers 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. https://doi.org/10.1109/TPAMI.2021.3066551 JCR-Q1 IF: 24.314 top-tier 111 citations ESI hot paper (top 0.1%) ESI highly cited paper (top 1%) Xinyu Chen, Mengying Lei, Nicolas Saunier, Lijun Sun (2022). Low-rank autoregressive tensor completion for spatiotemporal traffic data imputation. IEEE Transactions on Intelligent Transportation Systems. 23 (8): 12301-12310. 					
	https://doi.org/10.1109/	FITS.2021.3113608	10()			

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

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.

```
https://doi.org/10.1016/j.trc.2021.103226
```

\$ JCR-Q1 **■** IF: 9.022 **♀** top-tier

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.

```
    https://doi.org/10.1016/j.trc.2020.102673
    JCR-Q1
    IF: 9.022
    top-tier
    73 citations
```

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.

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.

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.

```
    https://doi.org/10.1016/j.trc.2017.10.023
    JCR-Q1
    IF: 9.022
    top-tier
    98 citations
```

- **♦** 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.

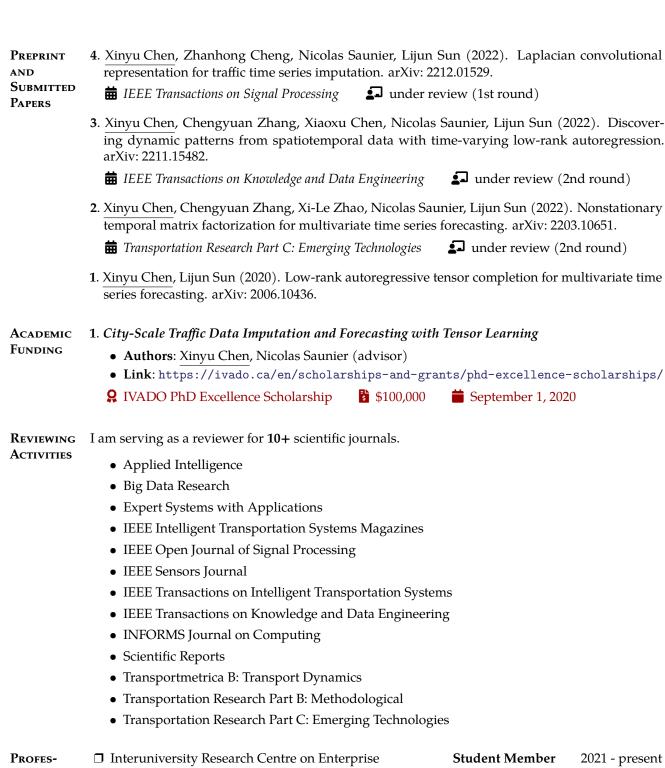
```
http://dx.doi.org/10.1007/s11067-021-09542-9
```

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.

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 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). Lowrank autoregressive tensor completion for spatiotemporal traffic data imputation. *The 7th SIGKDD Workshop on Mining and Learning from Time Series* (*MiLeTS*).



Profes- sional	☐ Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT)	Student Member	2021 - present		
Member- ships	☐ Institute of Electrical and Electronics Engineers (IEEE)	Student Member	2022 - present		
Open- Source Projects	I am leading some innovative projects on GitHub (3.2k+ stars & 600+ forks & 450+ followers).				
	◆ Selected repositories				
	transdim : Python codes for spatiotemporal data imput prediction using a variety of state-of-the-art machine le learning models.	2018.09 - present			
	🕠 xinychen/transdim 💢 950+ stars				

	⋑ awesome-LaTeX-drawing: Drawing Bayesian networks, graphical mode tensor structures, and technical frameworks in LaTeX. (Most examples from 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 🗘 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						
		Slides: https://xinychen.github.io/slides/traffic_dat	_	-			
		Low-rank matrix and tensor methods for spatiotemporal dat	a modeling.	2023.04			
		Sichuan University Liniversity of Electronic Science and Technology of 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://winyshop.github.jo/glides/phd.project_22gummer.pdf					
	• Slides: https://xinychen.github.io/slides/phd_project_22summer.pdf						
	□ Nonstationary temporal matrix factorization for multivariate time series forecasting. 2022			sting. 2022.05			
		Hong Kong Machine Learning Meetup (virtual)Slides: https://xinychen.github.io/slides/notmf.pdf					
	☐ Bayesian temporal factorization for multidimensional time series prediction.			2021.03			
	 IFT 6760A Course (Matrix and tensor factorization techniques for machine learning) Slides: https://doi.org/10.5281/zenodo.4693404 						
Blog Posts	G Posts I enjoy writing some blog posts about my research (30+ posts & 70k+ views & 300+ followers o 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)

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