

Taochun Sun

DEPARTMENT OF EARTH SYSTEM SCIENCE, TSINGHUA UNIVERSITY

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Fundamentals

Language:

Chinese (native), English (proficient), Deutsch (amateur)

Software:

◆ *Professional Softwares:*

ArcMap / ENVI / ERDAS :

Technology & methodology needed in the **geospatial industry**, e.g. mapping, geospatial analysis, GIS development & deployment, remote sensing imaging classification & assessment. ESRI individual challenge & team developer **prizes** (2018).

◆ *Computer Languages:*

Python :

Applications by Python, and its features. Familiar with the built-in functions, **data science related libraries** (Pandas, Matplotlib, Scikit-Learn, Numpy, Seaborn). Less familiar with **deep learning related libraries** (TensorFlow, Pytorch) and their derivative libraries (Pytorch-Geometric, Pytorch-Lightning). Some learning experience about **the source codes of relevant frameworks** (CPython, Pandas, Matplotlib, Scikit-Learn, Numpy, Seaborn, Plotnine). **GPA 4.0** (95) for the course *Advanced Machine Learning* in the department of computer science.

Based on the above-mentioned, I'm responsible for **the maintenance of servers in our group, maintenance & updating of the power sector in the Carbon Monitor project**, and some research topics including China provincial traffic emissions (see details in *Publications*).

Matlab / R / C / C++ :

Learning in the major courses, I can use for perfect applications to finish complicated tasks due to linguistic similarities among languages and understand the methodologies and logic behind common frameworks. Specific skills: **ggplot2, Matlab plotting and image analyses, C/C++ fundamentals (boost library, etc.)**.

Courses:

Climate change economics (B+), ecological economics (A-), advanced machine learning (A-), principles and methods of GIS (96), advanced mathematics (95), etc.

Research:

the [Carbon Monitor](#) ; carbon emissions, modelling & statistics, machine learning (deep learning) applications. See in publications.

Miscellaneous:

Academic :

I sincerely hope what we have published could raise individual awareness of protecting our planet (including China aha) and focusing on significantly important issues, including pollution mitigation, carbon emissions and public health.

Student Work :

I participated in a series of climate-change-related events, highly related to my PhD research and my interests and arousing my social responsibility of tackling climate change by youth actions and research-inspired scientific evidences. Doing things for common good is my everlasting pursuit as one of the youth.

Volunteer :

I am in the International Service Group of the Tsinghua University, helping to translate from Chinese to English some important notes and notices. I'm also the member of DataPi THU, translating data science articles published on some renowned professional websites into Chinese (cover articles); and the member of Huitiandi international department to spread advances of remote sensing and geospatial industries (cover articles).

Education

🌐 2020–Present	Graduate Student	Department of Earth System Science	Tsinghua University
🌐 2016–2020	B.E.(GPA: 3.69/5.0)	CGIST	Capital Normal University
🌐 2016-2020	Minor	College English Department	Capital Normal University

Publications

- Xu, Z.; Zhang, Z.; Zhong, R.; Chen, D.; **Sun, T.**; Deng, X.; Li, Z.; Qin, C.-Z. Content-Sensitive Multilevel Point Cluster Construction for ALS Point Cloud Classification. *Remote Sens.* 2019, *11*, 342.
- Liu, Z., Ciais, P., Deng, Z. *et al.* Near-real-time monitoring of global CO2 emissions reveals the effects of the COVID-19 pandemic. *Nat Commun* 11, 5172 (2020).
- Lu C, Adger W, Morrissey K, Zhang S, Venevsky S, Yin H, **Sun T**, *et al.* Distributional dimensions of health co-benefits from decarbonizing city-scale passenger transport: a scenario and risk assessment study. *Lancet Planetary Health.* 2021 (Under Review)
- Dou X, Deng Z, **Sun T**, *et al.* Global and local carbon footprints of city of Hong Kong and Macao from 2000 to 2015[J]. *Resources, Conservation and Recycling*, 164: 105167.

5. Dou X, Liao C, Wang H, *et al.* Estimates of daily ground-level NO₂ concentrations in China based on Random Forest model integrated K-means[J]. *Advances in Applied Energy*, 2021, 2: 100017.
6. Liu Z, Cui D, Deng Z, *et al.* Impact on China's CO₂ emissions from COVID-19 pandemic[J]. *Kexue Tongbao/Chinese Science Bulletin*, 2021: 1912-1922.
7. Liu Z, Deng Z, Ciais P, *et al.* Global Daily CO₂ emissions for the year 2020[J]. *Nature Geoscience* (under review).
8. Dou X, Wang Y, Ciais P, *et al.* Near-real-time global gridded daily CO₂ emissions[J]. *The Innovation*, 2021: 100182.
9. Davis S J, Liu Z, Deng Z, *et al.* Carbon dioxide emissions rebound from the COVID-19 pandemic[J]. *Nature Climate Change* (under review).
10. Cui D, Liu Z, Duan C C, *et al.* Daily CO₂ emission for China's provinces in 2019 and 2020[J]. *Earth System Science Data Discussions*, 2021: 1-31.
11. Deng Z, Ciais P, Tzompa-Sosa Z A, *et al.* Comparing national greenhouse gas budgets reported in UNFCCC inventories against atmospheric inversions[J]. *Earth System Science Data Discussions*, 2021: 1-59.
12. Liu Z, Zhu B, Ciais P, *et al.* De-carbonization of global energy use during the COVID-19 pandemic[J]. *arXiv preprint arXiv:2102.03240*, 2021.
13. Liu Z, Sun T, *et al.* Real-time carbon emission accounting technology towards carbon neutrality. *Engineering* (accepted)
14. Cai W, Zhang C, Zhang H, *et al.* The 2021 China report of the Lancet Countdown on health and climate change: seizing the window of opportunity[J]. *The Lancet Public Health*, 2021, 6(12): e932-e947.
15. Lu C, Zhang S, Tan C, *et al.* Reduced health burden and economic benefits of cleaner fuel usage from household energy consumption across rural and urban China. *2022 Environmental Research Letters 17 014039*

Honors and awards

- ✓ 2021: Scholarship of excellent student work in Tsinghua University
- ✓ 2020: [Outstanding members of Tsinghua Summer League School for Graduate Students](#) (36/250+)
- ✓ 2020: Outstanding graduates in Beijing

Student Work

- ✓ Teaching Assistant (Internship) of the course *Key Topics in Green Finance* in the [Schwarzman College](#) (2021)
- ✓ Committee member of [Sino-US Youth Dialogue on Climate Change](#) (foundation liaison, plan, academic review, outreach) (2021)
- ✓ Committee member of [Global Youth Summit on Net-Zero Future](#) (outreach with allied schools and **receive thank letters from Columbia, Yale and Oxford**, official website design, personal web publicization **retweeted by Philippe Ciais**, the foreign academian of CAS) (2021)
- ✓ Group Leader in the department of international communications in Graduate Union of Tsinghua (one of the departmental candidates of *the star of Graduate Union of Tsinghua*) (2021)
- ✓ [Co-Leader of the Information & Technology group of the T+Z Technology Review](#) in Graduates Union of Tsinghua (Leader of the publication of Harmony OS, **read by 4500+ people, publicized by Yuhao Jin in the graduate league of Tsinghua and official account of the graduate league of automation department in Tsinghua**)(2021)
- ✓ [Volunteer in the International Service Group of Tsinghua University](#) (XiaoyanOnline) (**excellent volunteer**) (2021)
- ✓ [Publicity Department of The Communist Youth League Committee of Tsinghua University Graduate Students](#) (2020)
- ✓ League branch secretary for league branch of class of graduate students in DESS for 2020 (2021-)
- ✓ CP branch publicity leader for CP branch of class of graduate students in DESS for 2020 (2020)
- ✓ Academic Department of both the [Tsinghua Astronomy Society](#) and the SABRI (2020-)
- ✓ [Datapie Translation Group](#) (correction, **cover article**)/ [International Department of Huitiandi](#) (correction, **cover article**) (2019-)