Fan LEI

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Education

08/2019-08/2025 **Ph.D.** in Computer Science — Arizona State University, USA
Advisor: Ross Maciejewski
Thesis title: Visual Explanation Tools for Spatial Modeling
GPA : 4.0/4.0

09/2013-01/2015 **M.S.** in Computer Science — Durham University, UK
Advisor: Tobias Weinzierl
Master project: Visual Analytics Framework for Academic Collaboration
GPA : 4.0/4.0 (1^{st} Honor, Distinction)

03/2012-07/2013 **BEng** in Information Technology — Technical University of Applied Sciences Lübeck, Germany
Advisor: Monique Janneck
Thesis title: Web Design Usability and the Techniques to Improve It
GPA : 88/100, (2:1) Honor

09/2009-01/2012 **BEng** in Electrical Engineering — East China University of Science and Technology, China
Bachelor project: J2EE-based Distributed System and Web Services
GPA : 88/100, (2:1) Honor

Research Interests

Visual Analytics, Information Visualization, Human-computer Interaction, Spatial Data Analysis, and Explainable AI (XAI)

Research Experience

VADER Lab, Arizona State University
Graduate Research Associate with Dr. Ross Maciejewski — 08/2019-present

2025 **Using LLM to combat the potential misinformation in journalism**
Using an LLM-based approach to detect, annotate, and explain the deceptive elements in news articles
Relevant publication : P8

2023-2025 **Explaining the spatial deep-learning models and evaluating the map-understanding capabilities of Multimodal Large Language Models (MLLMs)**
XAI for spatial deep learning techniques and benchmarking the map understanding performance of MLLMs against established baselines."
Relevant publication : P6

2022-2024 **Understanding the interplay between text and visualization**
Understanding reader takeaways in thematic maps under varying uncertainty and design considerations
Relevant publication : P4, W2

2021-2023 **Spatial data visualizations and their interdisciplinary applications**
Highlighting and linting the potential design issues for thematic maps, proposing a design guideline under the cartographic regulations, and applying spatial data analytical pipelines to other research domains
Relevant publications : P2, P5
Demo : `https://youtu.be/0-jMkvnN7vE?si=doELd9toP22PnYhC`

2020-2023 **Spatial data analysis and model explanation**
Explaining sophisticated local spatial models with contextual information and narrative visualization
Relevant publication : P3,
Demo : `https://youtu.be/vC7hG7Atty8?si=i_ZyRfDmD6qpHm09`

Institute of Automation, Chinese Academy of Sciences
Research Assistant with Dr. Daniel Dajun Zeng, and Dr. Qiudan Li — 06/2017-07/2018

2017-2018 **Catching dynamic heterogeneous user data for identity linkage learning in social networks**
Proposing an approach that combines explicit and latent feature fusion techniques to supplement and improve the user data fields in social media for identity linkage learning tasks
Relevant publication : P1

Department of Computer Science, Durham University
Master Project with Dr. Tobias Weinzierl 09/2013-01/2015

2013-2015 **Data Collection, Processing, and Visualization**
Developing an integrated data processing and visual analytics framework to collect, post-process, and visualize the information about the internal and external academic collaborations in the department of computer science of Durham University

Publications

Published Papers (peer-reviewed)

P8. A. Fan*, **F. Lei***, S. R. Corman, and R. Maciejewski. Skeptik : A hybrid framework for combating potential misinformation in journalism. *ACM Transactions on Interactive Intelligent Systems (TiiS) (*Arlen Fan and* **Fan Lei** *are co-first authors), to appear*, 2025. doi : 10.48550/arXiv.2508.18499

P7. **F. Lei**. *Visual Explanation Tools for Spatial Modeling*. PhD thesis, Arizona State University, 2025

P6. V. Srivastava, **F. Lei**, S. Mukhopadhyay, V. Gupta, and R. Maciejewski. MapIQ : Benchmarking multimodal large language models for map question answering. In *Proceedings of the Conference on Language Modeling (COLM)*, 2025, to appear

P5. **F. Lei**, D. A. Sampson, J. Hong, Y. Ma, G. Mascaro, D. White, R. Agarwal, and R. Maciejewski. FEWSim: a visual analytic framework for exploring the nexus of food-energy-water simulations. *IEEE Computer Graphics and Applications*, pp. 1–14, 2025. doi : 10.1109/MCG.2025.3581004

P4. A. Fan*, **F. Lei***, M. V. Mancenido, and R. Maciejewski. Understanding reader takeaways in thematic maps under varying text, detail, and spatial autocorrelation. In *Proceedings of the CHI Conference on Human Factors in Computing Systems (*Arlen Fan and* **Fan Lei** *are co-first authors)*, 2024. doi : 10.1145/3613904.3642132

P3. **F. Lei**, Y. Ma, A. S. Fotheringham, E. A. Mack, Z. Li, M. Sachdeva, S. Bardin, and R. Maciejewski. GeoExplainer: A visual analytics framework for spatial modeling contextualization and report generation. *IEEE Transactions on Visualization and Computer Graphics*, 2023 (Accepted by IEEE VIS 2023). doi : 10.1109/TVCG.2023.3327359

P2. **F. Lei**, A. Fan, A. M. MacEachren, and R. Maciejewski. GeoLinter: A linting framework for choropleth maps. *IEEE Transactions on Visualization and Computer Graphics*, pp. 1–16, 2023. doi : 10.1109/TVCG.2023.3322372

P1. **F. Lei**, Q. Li, S. Sun, L. Wang, and D. D. Zeng. Catching dynamic heterogeneous user data for identity linkage learning. In *2018 International Joint Conference on Neural Networks (IJCNN)*, pp. 1–8. IEEE, 2018. doi : 10.1109/IJCNN.2018.8489332

Working Papers

W1. V. Srivastava, **F. Lei**, M. V. Mancenido, A. M. MacEachren, and R. Maciejewski. Visualizing uncertainty on thematic maps and its impact on reader takeaways. Submitted to IEEE Transactions on Visualization and Computer Graphics (TVCG), under review

Professional Experience

Data Visualization Research Intern
Epsilon Data Management, LLC., Chicago, USA 05/2024-08/2024

Software Engineer & Research Assistant
Institute of Automation, Chinese Academy of Sciences, Beijing, China 08/2016-06/2017

Software & Full-stack Engineer | Automatic Warehouse Project Manager
Tao Heung Group Ltd., Hong Kong, China 10/2014-05/2016

Web Development Engineer (Backend)
ELEME Inc.(Alibaba Group), Shanghai, China 11/2014-08/2015

Powertrain Manufacturing Safety Engineer Intern
SAIC Volkswagen, Shanghai, China 09/2011-02/2012

Skills

Programming	**JavaScript** (including **D3.js**, Leaflet, etc.), **Python**, **TypeScript**, PHP, Java (JEE, JSE), C/C++, Microsoft .Net (C#), R, MATLAB
Frameworks	**React**, Vue, Angular, Svelte, Flask, Django, Spring, Hibernate, Laravel, Symfony
Database/storage	MongoDB, PostgreSQL, Redis, Microsoft SQL Server, MySQL
Misc.	Linux, LaTeX, ArcGIS, Web Servers (Nginx, Apache, Node.js), Project Management (Scrum, RUP)
Languages	English, Mandarin, German (basic)

Miscellaneous Experience & Award

2025	Program Committee of the International Symposium on Visual Information Communication and Interaction (VINCI 2025)
2023-present	Journal/conference paper reviewer of IEEE VIS, TVCG, UIST, Information Visualization, ACM TIST
2023	Doctoral Colloquium, IEEE VIS 2023 Conference
2013	The 1^{st} Class Scholarship, East China University of Science and Technology

References

Dr. Ross Maciejewski
Professor and Director, School of Computing and Augmented Intelligence, Arizona State University
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Dr. Jieqiong Zhao
Assistant Professor, School of Computer and Cyber Sciences, Augusta University
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