Dipl.-Ing. Dr. Velitchko Filipov, BSc.

Academic Resumé

Position:	Postdoctoral Researcher, TU Wien, Faculty of Informatics
Fields:	Computer Science, Human Computer Interaction, Visual Analytics, Network Analysis
Languages:	English (C2), German (C1), Bulgarian (Native)
LinkedIn:	**linkedin.com/in/velitchko-filipov**↗
Contact:	**velitchko.filipov@tuwien.ac.at**↗
Website:	**velitchko.github.io**↗
ORCID:	**0000-0001-9592-2179**↗
Scholar:	**scholar.google.com/citations?user=2FYZ3QYAAAAJ**↗
Research Gate:	**researchgate.net/profile/Velitchko-Filipov**↗

1 Education

2024 **Ph.D. (Dr.-Techn.)** *Vienna, Austria*
Doctoral Degree
TU Wien
Faculty of Informatics, Institute of Visual Computing and Human-Centered Technology
Dissertation: “Networks in Time and Space: Visual Analytics of Dynamic Network Representations”

2018 **M.Sc. (Dipl.-Ing.)** *Vienna, Austria*
Master’s Degree
TU Wien
Faculty of Informatics: Institute of Visual Computing and Human-Centered Technology
Thesis: “Visual Exploration and Comparison of Multiple Resumes: Focus on Time and Space”

2013 **B.Sc.** *Vienna, Austria*
Bachelor’s Degree
TU Wien
Faculty of Informatics: Institute of Visual Computing and Human-Centered Technology
Thesis: “Social Interface and Interaction Design”

2 Employment and Further Training

2024–Present	**Postdoctoral Researcher** *Vienna, Austria*	**TU Wien**
2017–2024	**PhD Student** *Vienna, Austria*	**TU Wien**
2023–Present	**CTO** *Remote*	**iPal Network**
2021–2023	**Developer** *Remote*	**Trading Sentiment (iPal)**
2015–2016	**Junior Web Developer** *Vienna, Austria*	**codeQ**
2012–2014	**Junior Researcher** *Remote*	**Crocotta R&D Ltd (Urban Hawk)**
2009	**Junior Web Designer** *Sofia, Bulgaria*	**Bianor (WiserTechn)**
2008	**Junior Web Designer** *Sofia, Bulgaria*	**Nextborn (WiseTech)**

3 Prizes, Awards, and Honors

Honorable Mention IEEE VIS 2025: Award
"Layers of Doubt: Typology of Temporal Uncertainty in Dynamic Diffusion Networks "
Awarded at IEEE VIS Uncertainty Visualization Workshop, 2nd of November 2025

Best Full Paper EuroVis 2025: Award
"NODKANT: Exploring Constructive Network Physicalization"
Awarded at EuroVis, 3rd of June 2025

Top Cited Article 2025: Award
"*Are We There Yet? A Roadmap of Network Visualization from Surveys to Task Taxonomies*"
Wiley & Sons, 19th of March 2025

Best Dissertation Nominee 2024: Entry
Dissteration: "Networks In Time and Space: Visual Analytics of Dynamic Network Representations"
TU Wien Informatics Awards, 2nd of December 2024

Best Paper VIS4DH 2019: Award
"Bridging the Gap between Visual Analytics and Digital Humanities: Beyond the Data-Users-Tasks Design Triangle"
Awarded at IEEE VIS 2019, Vancouver, Canada

Graph Drawing Contest 2019: Award↗
"The Fabric of Heroes"
Awarded at the 27th International Symposium on Graph Drawing and Network Visualization

Graph Drawing Contest 2018: Award↗
"The Circle of Thrones"
Awarded at the 26th International Symposium on Graph Drawing and Network Visualization

EPILOG - Best Master Thesis Nominee 2018: Entry↗
Thesis: "Visual Exploration and Comparison of Multiple Resumes: Focus on Time and Space"
Presented at TU Wien, 18th of January 2018

4 Invited Talks

- **IEEE VIS TVCG Invited Paper:** "TimeLighting" [Fil+24]
  IEEE VIS, Vienna, Austria, 2025
- **BioMedVis:** "Networks in Motion" [Fil25]
  Ludwig Boltzmann Institute, Vienna, Austria, 2025
- **IEEE VIS TVCG Invited Paper:** "A Space and Time Odyssey" [Fil+23a]
  IEEE VIS, Florida, US, 2024
- **WinterGraph:** "Research Unit Introduction" [Fil24b]
  (internal workshop), Kaprun, Austria 2024
- **Shonan:** "Dynamic Perspectives" [Fil24a]
  Material Sciences, Shonan, Japan, 2024
- **EuroVis CGF Invited Paper:** "Are We There Yet?" [FAM23]
  EuroVis, Leipzig, Germany, 2023
- **AustroVIS:** "Chronicals of Artist Networks" [Fil+23b]
  (internal workshop), AustroVIS, 2023
- **Vienna Perspectives:** "Interactive Music Mapping Vienna" [Fil22]
  Groove The City, Vienna, Austria, 2022

5 Academic Cooperation

SANE (FWF WEAVE) 2024 – ongoing
Role: (co-PI) Post-Doc. Senior Researcher, Visual Analytics
Principle Investigator: Asst.Prof. Alessio Arleo
Supervisors: Prof. Silvia Miksch
Funding: FWF 10.55776/I6635 (425,282 €)
Focus: Network Visualization, Spatio-temporal Data Visualization, Information Diffusion, Uncertainty Visualization, Visual Analytics,

ArtVis (FWF) 2022 – ongoing
Role: (co-PI) Post-Doc. Senior Researcher, Visual Analytics
Principle Investigator: Prof. Silvia Miksch
Supervisors: Prof. Silvia Miksch
Funding: FWF 10.55776/P35767 (410,779 €)
Focus: Network Visualization, Spatio-temporal Data Visualization, Visual Analytics, Digital Art History

Knowledge Assisted Visual Analytics (FWF) 2020 – 2022
Role: Pre-Doc. Junior Researcher, Visual Analytics
Principle Investigator: Prof. Silvia Miksch
Supervisors: Prof. Silvia Miksch
Funding: FWF 10.55776/P31419 (407,008 €)
Focus: Dynamic Network Visualization, Visual Analytics, Health Care, Knowledge Modelling

Interactive Music Mapping Vienna (FWF) 2017 – 2020
Role: Pre-Doc. Junior Researcher, Visual Analytics
Principle Investigator: Prof. Susana Zapke
Supervisors: Prof. Silvia Miksch
Funding: FWF 10.55776/AR384 (415,338 €)
Focus: Dynamic Network Visualization, Event-based Network Visualization, Visual Analytics, Digital Humanities

PolyCube (FWF) 2017 – 2019
Role: Pre-Doc. Junior Researcher, Visual Analytics
Principle Investigator: Dr. Eva Mayr
Supervisors: Prof. Silvia Miksch
Funding: FWF 10.55776/P28363 (342,895 €)
Focus: Network Visualization, Set-typed Data and Spatio-temporal Data Visualization, Visual Analytics

6 Service to Academic Community

I actively contribute to the academic community through reviewing, organizing, and committee work:

Journal Reviewing

- Computer Graphics Forum (Wiley & Sons)
- Transactions on Visualization and Computer Graphics (IEEE)
- Computers & Graphics (Elsevier)

Conference Reviewing & Program Committees

- Reviewer, ACM Symposium on Applied Computing – 2026
- Reviewer, IEEE VIS (Full and Short Paper Tracks) – 2024, 2025
- Reviewer, IEEE PacificVis (Conference and Journal Paper Tracks) – 2024, 2025, 2026
- Reviewer, Pacific Graphics (Full Paper Track) – 2025, 2026
- Reviewer, EuroVis (Full, Short, Education Paper Tracks) – 2024, 2025
- Reviewer, Graph Drawing & Network Visualization (Track 2) – 2024, 2025, 2026
- Program Committee, Track 2 @ Graph Drawing & Network Visualization – 2026
- Program Committee, Short Papers @ IEEE VIS – 2025
- Program Committee, EduVis Workshop @ IEEE VIS – 2025
- Program Committee, VIPRA Workshop @ EuroVis – 2024, BPM – 2025
- Program Committee @ Visual Analytics in Healthcare Workshop @ IEEE VIS – 2021, 2023, 2025

Workshop Organization and Chairing

- Paper & Session Chair, Visual Analytics in Healthcare Full-day Workshop @ IEEE VIS – 2025
- Organizer & Co-Chair, VisGames Half-day Workshop @ EuroVis – 2025
- Organizer & Co-Chair, VisGames Full-day Workshop (Second Edition) @ EuroVis – 2026
- Organizer, README.md Tutorial On Reproducability in Visualization Research @ EuroVis – 2026
- Co-Organizer EduVis Workshop @ IEEE VIS – 2026

Local Organization

- Local Organizer for **EuroVis**↗ – 2026
- Organizer for **AustroVis Workshop**↗– 2026

7 Teaching Activity

I support junior researchers and supervise students. I teach (Bachelor & Master) courses on information visualization and design.

Teaching (Bachelor and Master courses):

- (VO) Information Visualization
- (VO) Information Design and Visualization
- (UE) Information Design and Visualization
- (SE) Seminar on Human-Centered Computing, Information Visualization, Visual Analytics, Medical Informatics
- (PR) Projects in Media and Human-Centered Computing, Medical Informatics,
- (PR) Projects: Visual Computing 1 & 2
- (PR) Bachelor & Master Theses

Bachelor Theses:

- (2025) “Fuzzy Dynamic Networks”. Oliver Kastner
- (2025) “AdMaTilE: Visualizing Dynamic Adjacency Matrices in a Multiple-Coordinated-View System”
- (2024) “Temporal Motif Detection in Dynamic Networks”
- (2021) “PromNetworkVis: Dynamic Network Visualization to Patient-Reported Outcome Measures”
- (2019) “Visualization of Time-oriented Multivariate Survey Data”
- (2019) “EventQuery: Visual Querying & Pattern Matching in Time-Oriented Geospatial Data”
- (2018) “An Interactive Dashboard Approach for the Visual Analysis of Rocket Flight Data”

Master Theses:

- (2024) “Dynamic Network Analysis with Centrality Measures”
- (2023) “Utilizing Visual Analytics for Network Exploration in the Domain of Art History Research”

Building Collaborations

I actively build interdisciplinary collaborations, particularly with art historians and scholars in the humanities, by engaging directly with researchers and their problems. My approach is grounded in openness, initiative, and sustained dialogue: reaching out, starting conversations, and exploring whether there is a shared research question worth pursuing. Rather than beginning from predefined solutions, I focus on understanding domain-specific challenges, constraints, and opportunities, and on identifying where visualization and analytics can meaningfully contribute.

In practice, this translates into interactive, hands-on, and co-design-oriented methods that support stakeholder engagement, requirements elicitation, and communication across disciplinary boundaries. I place particular emphasis on onboarding and the development of shared conceptual language to support knowledge exchange and continuity in interdisciplinary research settings.

This approach to collaboration has led to a diverse set of joint publications, successful project proposals, and ongoing interdisciplinary research partnerships.

8 Research Statement

Abstract

My research centers around designing and developing visualization and analytics approaches for complex relational data. Much of my research involves collaboration with humanities researchers (i.e., art historians, musicologists, cultural heritage scholars), who need to understand influence, relationships, and change over time. My motivation for doing interdisciplinary research is to better align computational methods with how humanists think about, work with, and question data. They do close reading, focus on individual cases, and resist abstractions that omit context, while visualization tends to focus on distant views, aggregations, and statistical summaries.

Looking forward, I am investigating how generative AI and human-centered methods can enable people to work together with intelligent systems in analytical workflows as active collaborators who shape what gets generated and how. I further want to investigate situated and embodied analytics leveraging physicalization and tangible interaction to enhance learning, reasoning, and collaborative sensemaking in real-world settings. These directions share a commitment to amplifying human agency by building solutions and methods aligning with how people think.

My research so far.
I began with a practical problem in human resources and recruitment: "How do you compare multiple resumés efficiently?". This led to **CV3**↗ [Fil17; Fil+19a; FFM18], a system for visual exploration and comparison of curriculum vitae that handles temporal and spatial dimensions of career trajectories. The project taught me the importance of comparison as an analytical task [Gle+11; JE12], and it introduced me to the challenges of visualizing biographical and event-based data [Bre+17]. From there, I moved into humanities collaborations. The **Interactive Music Mapping Vienna**↗ project explored the lives and relationships of musicians in early 20th century Vienna [Fil+21; Fil+19b], connecting people, places, events, and themes through an event-based network visualization. Concurrently, I contributed to the **PolyCube**↗ project, which investigated how to visualize cultural heritage data collections across multiple coordinated space-time-cubes while maintaining visual coherence and supporting synoptic insights [Win+20]. These projects showed me a fundamental challenge: humanists don't just want to see patterns in the aggregate, they want to understand specific individuals, trace influences, and situate findings within historical and socio-political contexts. This made differences between distant and close reading become clear to me [Jän+15; Mor13]. We can build powerful abstractions and overviews, but if they don't let people zoom into the details that matter to them, the visualization approaches don't get used.

Building on these experiences, we established a collaboration with art historians at the University of Vienna that became the basis for the **ArtVis**↗ project. We're investigating exhibition networks of early 20th-Century artists to understand how artistic styles and movements spread through co-exhibition activity. These topics are central to current art historical research [Lin16; Sch+14; Tus+25]. Our system visualizes dynamic networks of artists, venues, and exhibitions across time and space. Art history students actively work with it in seminars to explore questions about influence, canonization, and artist networks. We continue to refine it in response to feature requests and student feedback. This iterative, in-use development process has shaped how I think about collaborating with domain experts and conducting research. It is a successful project and dissemination of visualization into another discipline where it is actively used.

Throughout my doctoral studies I have investigated how we can effectively represent time in networks. I started this with an exploratory study in 2021 [FAM21] comparing structural representations like node-link diagrams and adjacency matrices [GFC04; HFM07] with different temporal encodings. The results were interesting enough that I pursued the question further. I submitted an extended version to Graph Drawing in 2022 [Fil+23b], which was then invited for a journal extension in IEEE TVCG in 2023 [Fil+23a], and culminated in an invited presentation at IEEE VIS 2024. This multi-year process taught me about persistence and the value of really opening up a problem rather than moving on after a single publica-

tion. The results challenged some assumptions in the literature which is what sparked this interest. As networks grow in size and complexity [Lan+11], it becomes increasingly difficult to identify which actors or events play a pivotal role in shaping outcomes. This piqued my interest in the concept of information diffusion in dynamic networks that we are tackling within the **SANE**↗ project. Diffusion is a powerful abstraction [KKT03; KM27] and presents a method to treat influence as something that propagates through a network, we can quantify the relative importance of nodes, edges, or events in a principled way. However, this concept is underexplored in cultural contexts. "How do artistic styles diffuse through exhibition networks?" "What role do specific actors or venues play in spreading or blocking certain movements?" I'm currently writing a research proposal to model artistic influence as probabilistic diffusion over dynamic networks, adapting techniques from epidemiology [KM27; PV01]. The idea is to treats exhibitions as transmission events [Bon+12] and use diffusion models to simulate how styles propagate through the network over time.

Where I want to go.

Research Question

"***How can visual analytics, human-centered computing, and generative methods empower human agency and their capabilities to explore, interpret, and reason about complex relational and dynamic processes***?"

This question guides my research vision. Networks, cultural datasets, and relational systems are all growing in size and complexity and it is increasingly difficult to identify key actors, trace influences, and make sense of emergent patterns. My goal is to develop visual analytics systems and paradigms to reveal these structures but also amplify human agency, enabling researchers, domain experts, learners, and practitioners to engage meaningfully with data, uncover insights that were previously inaccessible, and explore questions that could not be answered before. Currently, my projects reflect different aspects of this vision. The ongoing art history collaboration (**ArtVis**↗) and the project on information diffusion **SANE**↗ demonstrate how domain-grounded approaches can support interpretation and reasoning about influence in networks and behavioral changes over time. Complementing these, my work on physicalization examines how embodied engagement with data can enhance learning, reasoning, and interact with complex data. Hands-on interaction reduces people's cognitive load and makes complex data and concepts accessible to a broader audience. I see three significant and interconnected research directions for pursuing this vision:

I. Agentic Visual Analysis – focuses on the methodological foundations of working with agentic and generative AI when both designing and developing as well as actively using visual analytics techniques to analyze complex relational. Models and their capabilities are advancing at such a rapid pace that it is my belief we need to fundamentally rethink their role in visualization and HCI research. This direction goes beyond adding existing generative AI models for well-known problems and more into the direction of providing structure and context to guide what these models generate and how they can collaborate and work with people. The main contributions would be be model-agnostic frameworks, design patterns, taxonomies, and structured workflows that others can use when integrating generative AI into visual analytics systems. The next step I see in this direction is to consider methods and ensure that models align with these to augment rather than replace human analytical and creative capabilities [Dha+25]. An example use case could be: a researcher asks to explore how a phenomenon spread through a network, the system should understand what views, analytics, and interactions make sense for that question because it has integrated domain knowledge and the methodological repertoire of network analysis and visualization. This requires moving beyond generic chart generation toward systems that understand analytical workflows and domain-specific reasoning practices. This work builds on established human-AI interaction principles [Ame+19; Shn20] and aims to address specific interpretation and sense-making challenges in visual analytics contexts [Cen+17; Kei+08].

II. Situated & Embodied Analytics – extending my work on physicalization and tangible visualizations, I am further interested in how analytical work and collaborative analysis [Ise+11] can move fluidly across

time, space, and devices. I am interested in how people can work together in (or across) physical spaces with distributed interfaces and physical artifacts, particularly, when they need to reason about complex data and problems. Recently, we explored how physicalization can provide a foundation for thinking about tangible and embodied cognition [ACD09; Wil02]. In HoloGraphs, we explored how dynamic networks can be represented as layered physical artifacts that preserve temporal structure while providing intuitive physical affordances. People were enabled to remove, overlay, separate, and order timeslices. Our approach supported reasoning and comparison through physical and tangible manipulation. The ways in which people interacted with HoloGraphs align closely with core comparative visualization strategies such as juxtaposition and superposition [Gle+11; JE12] and space-time-cube operations [Bac+17], but are realized as natural, embodied actions rather than explicit interface commands. Following up with NODKANT [Pah+25], we demonstrated the cognitive value of embodied interaction with networks. People who physically construct their own network representations can extract significantly more insights during construction and retain more information over longer periods of time. This phenomenon of embodied cognition fundamentally changes how people learn and reason about complex data. Across both these projects [Pah+25; PEF25], physicalization emerges as a means to surface interaction techniques grounded in intuitive human comparison and reasoning, providing guidance for the design of human-centered interactive systems. Building on these insights, we can start exploring how visual and analytical views can be distributed across physical space, tangible computing, and devices to support collaborative sensemaking and human-centered system design. This perspective aligns with work on visualization beyond the desktop [JD13; Jan+15] and frames physicalization as a means to study how people naturally coordinate, compare, and reason about data together when interfaces are embedded in shared environments. Games and playful activities, such as the ones we explore in the **VisGames**↗ workshop, represent another form of situated engagement where learning and collaboration happen through embodied, interactive play rather than traditional interfaces.

III. Building for Interdisciplinary Research – is a topic often discussed in literature and workshop settings. Transferable methods for interdisciplinary research are still considered an open challenge and are non-trivial, particularly, at the intersection of computer sciences and humanities [Sch+19]. A persistent challenge in the visualization and HCI community is that there exist a plethora of existing tools and approaches, their adoption rates, however, remain low and are rarely utilized outside of the case studies that are described in the associated papers. This divide is especially expressed in disciplines such as digital humanities, where the developed approaches and methods often clash with the interpretive nature of the research practices in the field. We treat interdisciplinary work as unidirectional: visualization builds solutions for other domains. What we usually do not consider is the reverse, how other domains can contribute to visualization research? This asymmetry is a missed opportunity. Domains like art history have developed sophisticated methods for dealing with ambiguity, context, and interpretation over centuries. These aren't problems visualization has solved - we often abstract them away. What if close reading techniques informed how we design detail views? What if historiographic methods for evaluating sources shaped how we represent data provenance and uncertainty? My approach, demonstrated in the **ArtVis**↗ project, pursues this bidirectional exchange [Hal+20]. Art historians use the system and their interpretive practices actively shape what we build. When they critique our abstraction and aggregation approaches that erase individual agency, they highlight something fundamental about networks and influence that our standard methods miss. Additionally, games and playful activities emerge as a new direction to facilitate interdisciplinary collaboration. I co-organize the **VisGames**↗ workshop, which explores visualization games as methods for co-creation, communication, and participatory design across disciplines. These approaches create shared spaces for dialogue and help bridge epistemic gaps through play and interaction [Sto+25]. In order to understand various disciplines and research methods, we need to actively engage with the problems rather than treating them as convenient application areas and case studies we could use. This involves developing frameworks to establish productive collaborations, negotiating between different epistemic cultures, building solutions that respect domain expertise and augment their capabilities with state of the art computational methods [Mul02; SG89]. This direction matters because reciprocal interdisciplinary research produces knowledge neither field could generate alone.

Taken together, these three directions address complementary facets of the research question. **I. Agen-**

tic Visual Analysis focuses on augmenting analytical workflows through structured human–AI collaboration; **II. Situated & Embodied Analytics** grounds reasoning in physical and social interaction; and **III. Building for Interdisciplinary Research** ensures that these approaches respect and incorporate domain-specific interpretive practices. Together, they aim to amplify human agency across exploration, interpretation, and reasoning in complex relational and dynamic systems.

How I can contribute.
The Department of Computer Science at Aarhus, particularly the Human-Centered Computing and Computational Social Sciences group, aligns well with where I want to take my research. My work sits naturally at the intersection of these areas. I apply computational methods like network analysis and diffusion modeling to social and cultural phenomena, which is central to social science research. At the same time, my focus on building approaches that work with people's actual interpretive practices that connects to adaptive interfaces and situated analytics aligning with human-centered computing.

I can complement the existing strengths in several ways. Gabriela Molina León's recent work on agentic visualization [Dha+25] connects directly to my interests in generative VA and structured, context-aware systems for domain-specific applications. Niklas Elmqvist's research in ubiquitous analytics and participatory AI [Elm+25] maps well to my questions about collaborative analytics, physical and tangible interactions, and human-centered design. Hans-Jörg Schulz's work on network and graph visualization, particularly, closely aligns with my research on dynamic and temporal networks. The emphasis on in situ exploration [HSS11] and multifaceted graph representations [HSS15] resonates with my interest in how people navigate, interpret, and reason about complex relational data over time.

My background in dynamic networks, diffusion processes, and humanities collaborations brings a different perspective to the CSS group. I've spent years working with art historians, musicologists, literary scholars, and cultural heritage researchers, which has taught me how to bridge computational methods and interpretive practices. This experience with grounded, domain-driven development could add something distinctive to the department's research profile.

References

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9 Teaching Statement

My teaching philosophy is about getting our hands dirty together. I find that knowledge is **constructed, questioned, and worked with** rather than passively absorbed. My approach is grounded in active learning and constructivist pedagogy: students learn by doing, by failing, by making decisions under uncertainty, and by engaging directly with problems that are not always easy to answer.

I teach information visualization and design at both bachelor and master levels, and across these contexts I try to move beyond presenting encoding principles or interaction techniques. I encourage students to build visualizations, critique them, break them intentionally, and defend their choices. I've supervised 10 completed theses (8 bachelor, 2 master) and currently guide 2 more bachelor students and am supporting junior PhD researchers. What connects these experiences is an approach built around questions rather than answers. I provide structure and scaffolding but leave space for students to construct their own research and understanding.

Constructivist learning theory tells us that knowledge isn't transferred, but built through scaffolded engagement with authentic problems. When I teach visualization courses, I do not just present the "rules" and "guidelines". We explore datasets together, try different encodings, observe what fails, and reason about why. One of my favorite moments in class comes when we wrap up the topic of design guidelines by intentionally breaking every one of them. Students see for themselves how choices shape results, which helps them build a deep understanding of why some approaches succeed and others do not. They understand why some things work, because they've seen the alternatives we made. Their feedback about this is also quite positive.

Teaching requires flexibility and attentiveness. I teach classes of varying sizes, and I'm aware that a 100+ student lecture demands different strategies compared to a smaller group of 10 students. But I believe it is important to create opportunities for students to actively engage with the material, whether through in-class problem-solving, peer discussion, hands-on prototyping, or reflective exercises. Given the opportunity of shaping courses and curricula, I want to open with informal sessions where students articulate what they want to learn. At the end, we revisit those goals and reflect on what was achieved. I want to actively involve and co-create the learning environment with the students, make a space for diverse voices and goals.

There are three things I try to help students develop, and I think they matter beyond any specific course or project.

- First, **critical reflection**. Question everything: your visualizations, your assumptions, the "best practices" you read in papers, and my feedback too. To me questioning, is the foundation of research and science and I reflect this in my teaching. The most interesting work emerges when we challenge what's taken for granted, when we ask whether a design actually answers the question it claims to answer, or whether a technique is appropriate for the context at hand. I try to encourage students to push back, to interrogate claims, and to develop their own critical lens.
- Second, **decisiveness**. Make a decision. Commit to a direction and iterate. Students, especially early-career researchers, often paralyze themselves with choice: which framework, which dataset, which venue, which design. I try to teach them that standing still is worse than moving in an imperfect direction. If the choice is wrong, we adjust. If it's right, we build on it. But indecision is stagnation.
- Third, **movement**. Prototype early. Fail fast. Don't sit on an idea too long. Progress requires motion, not just in projects, but in thinking, in research trajectories, in career development. The lack of movement is death. I encourage students to get their hands dirty quickly, to build something tangible, to test ideas rather than over-theorize them. This is how we discover what we don't know, and how we keep momentum even when the path forward is unclear.

I think about these things in my own research too, and students see me question my own designs, pivot when something isn't working, and keep projects moving even when progress feels slow. My approach to supervision is more about mentoring than managing. My thesis supervisions span topics from dynamic

network analysis to geospatial event querying to medical data visualization, reflecting the breadth of students' interests and the flexibility I try to afford them. I prefer to sit down together, plan, then schedule regularly check-ins to adapt and adjust if necessary. I am aware that some students need more structure whereas others thrive with autonomy, some are confident and direct, whereas others need encouragement and support. I try to meet them where they are. This extends to my work with junior researchers as well, I collaborate closely with four PhD students. We tackle problems together, challenge each other's assumptions, and iterate rapidly. Some of the best things have come from these sessions because we asked the right (and wrong) questions.

In teaching, failure is usually the thing students fear most. To me failure is normal, necessary, and generative. I'm transparent about my own failures: rejected papers, visualizations that didn't work, projects that stalled. In class, I want students to see that setbacks are part of the process. So we deliberately test ideas that may fail, analyze why they do not work, and discuss the lessons these experiences reveal. This hands-on approach helps students internalize learning in a tangible way. I find this to be incredibly important for students who are already marginalized or lack confidence. I'm aware that students come from different backgrounds, cultures, genders, ages, and levels of experience. As someone who has spent most of my life abroad, I know what it feels like to be on the outside. I try to create inclusive spaces where diverse perspectives are not just tolerated but valued. I make all materials transparent and accessible and I encourage students to ask questions immediately, rather than waiting for email or office hours. I believe this is how we can build trust and create environments where people feel heard and included.

Computer science is rapidly developing and paradigm shifts happen all the time. Students today are navigating technological changes, complex ethical questions, and interdisciplinary research contexts that didn't exist a decade ago. We need to adapt our teaching methods to match the complexity and pace of the field, to equip students not just with knowledge but with the capacity to question, decide, and move. I see teaching as research in its own right: an iterative process of hypothesis, experimentation, and refinement. Every semester, I incorporate student feedback and adjust content, structure, and methods. I pay attention to what works and what doesn't.

Ultimately, I believe the most impactful thing I can do as an educator is to help students become independent, critical, and confident thinkers who can navigate uncertainty and complexity. I want them to leave my courses not just with technical skills, but with the capacity to ask hard questions, know how to approach problems, make bold decisions, and keep moving even when the path isn't clear.

Open Science: My publications are open access (**Google Scholar**↗; **Web of Science**↗; **ResearchGate**↗). Implementations as well as results and analysis are open-sourced (**GitHub**↗ and **GitLab**↗). I actively promote reproducibility, replicability, and transparency in academic research (**GRSI**↗), providing all materials linked to my publications on **OSF**↗.

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