Lukas Maximilian Masopust

Software engineer specializing in public-facing scientific data systems and applied visualization. I work with research teams at UC Davis through the AI Institute for Next Generation Food Systems (AIFS) and the AI Institutes Virtual Organization (AIVO), designing and implementing scalable platforms that translate AI-driven research into usable tools for researchers, policymakers, and the public across the food systemand beyond. My work emphasizes research translation, interoperability, and evidence access through knowledge-graph interfaces, structured research databases, and multivariate scientific visualization within federally funded AI initiatives.

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EDUCATION

Research & Technical Focus: Human-centered data visualization, AI-enabled web platforms, scientific communication, decision-support systems

2019 – 2022 **University of California, Davis** GPA 4.0

MS in Computer Science

I worked under Prof. Kwan-Liu Ma across multiple research projects intersecting human-computer interaction and information visualization. My primary project focused on wildfire mitigation, where I collaborated with Yolo County's Office of Emergency Services to develop a platform for visualizing multi-attribute wildfire data, supporting operational decision-making for emergency planning and response.

2016 – 2018 **Vienna University of Technology (TU Wien), Austria** GPA 3.4

BS in Computer Science

I specialized in visualization and collaborated with Prof. Eduard Gröller and ImageBiopsy Lab, an innovative bioinformatics startup in medical imaging. My thesis focused on browser-based visualization of osteoarthritic knee joints using machine-learning models.

SKILLS

Scientific Data Systems & Infrastructure
Knowledge graph interfaces, data standardization, structured data modeling, API integration, research data platforms

Visualization Frameworks
D3, DeckGL, Plotly, Observable, Matplotlib, ThreeJS

Web Engineering
JavaScript, TypeScript, React, Next.js, Vue

Cloud & Services
AWS (S3, SES, Cognito), Vercel, Route53, Sanity, WordPress

UI Frameworks
HeadlessUI, NextUI, ChakraUI, MUI, TailwindCSS, Sass

Programming & ML (Foundational)
Python, Java, C++, C#, Unity; CNN-based computer vision models

EXPERIENCE

since 2022

AI Institute for Next Generation Food Systems (AIFS) & NSF AI Institutes Virtual Organization (AIVO)

Davis, CA

Web Applications Programmer

At AIFS and its umbrella organization AIVO—NSF- and USDA-funded AI research institutes with additional philanthropic support from initiatives associated with the Bezos Earth Fund and Google Philanthropy—I design and build public-facing scientific infrastructure that translates AI-driven food-systems research into scalable, usable platforms. I collaborate directly with faculty and interdisciplinary research teams and coordinate development efforts to deliver production-grade systems that extend scientific work beyond academic audiences. My work spans knowledge-graph interfaces, structured research databases, advanced scientific visualization, and public platforms supporting research translation and data interoperability.

FoodAtlas Live Website Project Portfolio

Designed and implemented the public-facing interface for an AI-enabled knowledge graph exposing 270,000+ structured food–health associations. Built interactive query and exploration systems enabling compound-level biochemical discovery and research translation. Over the past 12 months, the platform recorded 11,200+ page views from 4,200+ users across 15+ countries, with the largest share of usage originating in the United States (39%).

Preclinical Database Live Website Portfolio

Engineered the structured data platform and validation interfaces for an AI-driven repository of in vivo preclinical studies, enabling standardized exploration of disease, drug, and animal entities and interoperability with established ontologies to support large-scale biomedical research.

Milk Composition Atlas Live Website Project Portfolio

Designed and developed an interactive visualization platform for analyzing bioactive compound–SNP interactions as part of an academic manuscript under review. Implemented coordinated network graphs, matrices, volcano plots, and Sankey diagrams to support multivariate genomic and compound-level exploration.

Dairy Molecule Database Live Website Project Portfolio

The Dairy Molecule Database (DMD) is a structured research repository developed in support of the largest milk-molecule profiling study conducted in the United States to date. The platform organizes molecular and associated omics data from whole milk samples into a searchable interface with programmatic API access. It enables researchers to explore, compare, and analyze compositional differences across samples through structured data modeling and interactive tools. Designed to support rigorous scientific inquiry, DMD facilitates reproducible investigation of milk-related biochemical composition.

Byproduct Database Live Website Portfolio

Developed an interactive analytics and visualization system for agricultural waste streams, integrating environmental and economic metrics to support sustainable food production strategies.

AIFS Institute Website Live Website Portfolio

Led full redesign and technical implementation of the institute's primary research portal. Built a scalable content and publication platform showcasing 40+ funded projects, significantly increasing visibility and doubling daily user engagement.

Swap-It-Smart Under Development • Planned Launch 2026

Developing an AI-assisted ingredient substitution system that translates compound-level nutritional research into interactive decision-support tools for healthier and more sustainable dietary choices.

2019 – 2022

Visualization and Interface Design Innovation Labs

Davis, CA

Graduate Student Researcher & Teaching Assistant

Conducted research at UC Davis' Center of Excellence for Visualization, focusing on interactive systems for scientific data analysis and decision support as well as HCI research. I authored a paper on user fatigue in extended reality and later developed a wildfire decision support system to enhance emergency response.

HexTile Portfolio

Developed a multivariate geospatial decision-support system for wildfire analysis in collaboration with Yolo County's Office of Emergency Services. Enabled exploration of environmental and situational factors influencing wildfire behavior to support planning and response decisions.

2017 – 2019

ImageBiopsy Lab, Vienna

Vienna, AUT

AI Researcher & Software Engineer

Developed computer vision and machine learning models for automated detection and quantitative analysis of vertebrae and knee joints from clinical X-ray imaging. Implemented convolutional neural networks (CNNs) for anatomical landmark detection and measurement extraction, supporting evaluation of malignant bone pathologies. Additionally, built a web-based analysis interface for automated osteoarthritis scoring and clinical visualization to support research and diagnostic workflows.

2016 – 2019

Freelance Software Engineering

Vienna, AUT

Software Engineer & UI/UX Designer

Developed production web and mobile applications across education, cybersecurity training, and financial analytics domains, working independently and in collaboration with early-stage startups.

Selected Projects

Docstr (medical entrance preparation apps reaching hundreds of monthly users), Sicherheit Lernen (cybersecurity training platform concept for Austrian businesses), and Oanda Trader (financial trading application built with domain experts).

SELECTED IMPACT

Public scientific infrastructure: Built public-facing platforms that expand access to federally funded and philanthropically supported AI research in food systems (USDA, NSF, and initiatives supported by the Bezos Earth Fund and Google Philanthropy), enabling broader dissemination and use by researchers and non-academic stakeholders across the United States and internationally.
Research translation & interoperability: Developed systems emphasizing structured data, validation workflows, and ontology-aligned entities to improve evidence accessibility and reuse across scientific communities.
Decision support: Created interactive visualization and decision-support tools for high-impact domains including food systems and wildfire response in collaboration with public-sector stakeholders.

PUBLICATIONS & AWARDS

Google Scholar

Under Review

Omics Analysis Discovers Nutrient Composition and Bioactivities of U.S. Milk

Co-author. Submitted to Nature Communications (under review).

2021

A Comparison of the Fatigue Progression of Eye-Tracked and Motion-Controlled Interaction in Immersive Space

IEEE International Symposium on Mixed and Augmented Reality (ISMAR) • DOI:10.1109/ISMAR52148.2021.00063

Peer-reviewed conference paper; presented at ISMAR 2021. 11 citations (Google Scholar).

2022

HexTile – A Visualization Design for Multivariate Geospatial Events

Master's Project • University of California, Davis

2018

Web-Based Osteoarthritis-Analysis: Generating Data from Native Libraries and Machine-Learning Models

Bachelor's Thesis • Vienna University of Technology (TU Wien)

2019–2020

Computer Science Graduate Group Fellowship

College of Engineering • University of California, Davis