

David Kutas

Ph.D., M.Sc., Dipl.-Ing., B.Sc.

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EDUCATION

- 2022 **Ph.D., Software Engineering, University of California, Irvine, CA, USA**
Focus: Human Computer Interaction and Software Engineering
Dissertation Title: A Temporal and Hierarchical Data Visualization
Infrastructure Based on Fluid Zoomable User Interface
Advisor: James A. Jones
- 2021 **M.Sc., Software Engineering, University of California, Irvine, CA, USA**
Focus: Human Computer Interaction and Software Engineering
Thesis Title: Elastic Zooming: Enabling a Single User Interface for the
Multi-Device World
Advisor: James A. Jones
- 2016 **Dipl.-Ing., Drilling Engineering, Montanuniversitaet Leoben, Austria**
Focus: Data Acquisition and Interpretation, Health Safety and Environment
Thesis Title: Real-Time Kick Detection with Ultrasonic Sensing
Advisor: Gerhard Thonhauser
- 2014 **B.Sc., Earth Sciences and Engineering, University of Miskolc, Hungary**
Focus: Fluid Mechanics
Thesis Title: Operation Analysis of the Big Wind
Advisor: Anita Jobbik

PROFESSIONAL EXPERIENCE

2024-ongoing **Founder, Chronus Design, Bay Area, CA, USA**
A product design company specializing in data visualization products.
Selected works are showcased at <https://portfolio.davidkutas.com>.

- Developed new zoomable user interface-based data visualization software platform (based on WebGL/WebGPU, and Svelte) with multiple visualization micro-applications (using existing backend data acquisition technologies) for an international energy company.
- Developed web application for Raspberry Pi-based bioreactor that aims to democratize the access to modern bioreactors in research labs.
- Developed new alpine skis that work well in slushy spring snow as well as deep, fluffy powder snow.

2022-ongoing **Sr. Data Experience Design Engineer**, Visa, Inc., Foster City, CA, USA
Data Experience Team. Manager: Christopher DeMartini (Tableau Hall of Fame Visionary).

- Contributed to the development of accessibility-focused, open-source, internationalized Visa Chart Components chart data visualization design system. (<https://github.com/visa/visa-chart-components>).
- Developed new accessibility features (e.g., keyboard navigation, WAI-ARIA).
- Developed LLM-based conversational UI for data visualization & accessibility.
- Provided maintenance and product development support to internal and external clients, achieving high satisfaction rate.

2022 **Research Scientist Intern**, Adobe Research, California, USA

(<https://research.adobe.com/>)

Breakthrough Interaction Group (BIG). Manager: Valentina Shin

(<https://hishin.github.io/>). Collaborators: Mira Dontcheva, Kim Pimmel

- Developed multitrack effect visualization and interaction mechanisms for a novel transcript-based video editing tool, called Project Blink.
- Conducted formative user studies to gather feedback on design alternatives.
- Prototyped software flow in React for adding and editing multimedia tracks to a transcript-based UI.
- Authored and filed utility patent application to USPTO. Patent Nr: 18/152328 (<https://patentcenter.uspto.gov/applications/18152328>).

2019-2022 **Co-founder, Product Designer, Full Stack Developer**, Linecept, California, USA

Research and development of a design coordination tool based on Fluid Zoomable User interface.

- Designed UI & UX of a productivity web app.
- Designed and built ~50 design system components (e.g., Wheel Date Picker) for the web app.
- Developed a multi-tier web app in MERN Stack.
- Developed internal CI/CD pipeline on Raspberry Pi to create a zero cost solution for deployment and prototype maintenance.
- App reduced the time for course instructors to review students' work by ~85%.
- Filed utility patent for the novel user interface and interaction mechanism called Fluid Zoomable User Interface (FZUI).

2018-2019 **Teaching Assistant**

2020-2022 University of California, Irvine, CA, USA

- Aided course instruction in undergraduate and graduate level courses (list of courses listed in Teaching Experience section).
- Lead student evaluations in undergraduate and graduate level courses.

2019-2020 **Graduate Research Assistant**

University of California, Irvine, CA, USA

- Participated in daily research activities.
- Conducted user interface and experience research.

2019 **Full-Stack Research Software Engineer Intern**

NextGen Healthcare, Inc., Irvine, CA, USA

- Designed and built a proof of concept (POC) embeddable widget for the Health Data Hub platform.
- Conducted user interface and experience research embedded into the research and development engineering team.
- Developed front end for proof of concept with React framework and a RESTful API-based endpoint query.

2017-2018 **Drilling Engineer**

Wintershall GmbH, Frankfurt, Germany; The Hague, Netherlands; North Sea (Dutch, Norwegian and UK Sectors); Buenos Aires and Neuquen, Argentina

- Responsible for reporting about daily operations on different offshore platforms and land rigs to the site supervisor.
- Responsible for summarizing specialist, large-scale data visualizations and reports into easy-to-interpret, high-level summaries and visualizations.
- Involved in well architecture design and project management.

2008-2018 **Enter The Unknown Design Lab**

Miskolc, Hungary; Leoben, Austria. Some works are showcased on <https://portfolio.davidkutas.com>

- Developed branding materials for small to medium-sized businesses worldwide.
- Developed thematic, interactive figures for academic publications.
- Designed alpine skis for the 2018 PyeongChang Winter Olympic

Games.

- Design knife safety system for Smith & Wesson.

RESEARCH PROJECTS

2022 **Multitrack Multimedia Effect Visualization and Interaction Mechanism**

Main collaborators: Valentina Shin, Mira Dontcheva, Kim Pimmel
Adobe Research, Adobe Inc.

I participated in the research and development of Project Blink (<https://labs.adobe.com/projects/blink/>), a text-based AI video editing tool. I spearheaded the invention of a new interaction mechanism that allows wrapped timeline-based multimedia tracks to be edited with ease on a text-based video editing user interface. The research and development resulted in a paper proposal as well as utility patent. Patent Nr: 18/152328 (<https://patentcenter.uspto.gov/applications/18152328>).

2018-2022 **Fluid Zoomable User Interface and Its Application in a Temporal and Hierarchical Visualization Infrastructure**

Supervisor: James A. Jones
University of California, Irvine

I proposed a research project that aimed to research a time based data visualization software infrastructure built on my invention (Fluid Zoomable User Interface [earlier named Elastic Zoomable User Interface]). I designed and carried out an institutionally approved human subject research plan and protocol involving an online and in-person studies in order to empirically evaluate the Fluid Zoomable User Interface. I used different statistical methods to evaluate the collected data.

The research resulted in Ph.D. dissertation, M.Sc. thesis, publications and a potential decades long research and commercial product development initiative.

2015-2016 **Real-time Fluid Influx Detection with Ultrasonic Sensing**

Supervisor: Gerhard Thonhauser, Michael Prohaska, Claudia Gruber
Montanuniversitaet Leoben, Thonhauser Data Engineering GmbH

I participated in the development and testing of an experimental product that was able to detect fluid influxes in wellbores in real-time by ultrasonic sensing. If such a solution would have existed in 2010, then the Deepwater Horizon oil spill (Gulf of Mexico, US sector) could have been completely

avoided. The research resulted in pilot deployment of the product and M.Sc. thesis:

[https://pure.unileoben.ac.at/portal/en/publications/realtime-kick-detection-by-ultrasonic-sensing\(504cd2b7-9b38-4190-8d4b-73fc4ee8d669\).html?customType=theses](https://pure.unileoben.ac.at/portal/en/publications/realtime-kick-detection-by-ultrasonic-sensing(504cd2b7-9b38-4190-8d4b-73fc4ee8d669).html?customType=theses)

2013-2014 **Operation Analysis of the Big Wind**

Supervisor: Anita Jobbik
University of Miskolc

I initiated a project where I verified why a jet-engine-based firefighting device called the Big Wind is efficient in the elimination of oil and gas well blowouts with fluid dynamics and finite element analysis. The device was deployed by the Hungarian blowout specialists in the first Gulf War helping US forces terminate more than 800 burning oil fires. I also defined possible future development ways for such devices in fighting large scale technological and natural fires. I wrote my B.Sc. thesis about this topic:

<http://midra.uni-miskolc.hu:80/?docId=17835>

2012-2014 **CriticEL Project**

Supervisor: Janos Foldessy

I contributed to the data and thematic map visualizations of the published research papers, and books. The CriticEL project was a fundamental research program into the exploitation of the economic development potentials of critical raw materials in Europe. I participated in this project as an undergraduate student assisting in input data validation and data visualization.

The project resulted in 10 books. More information:

http://kritikuselemek.uni-miskolc.hu/index_en.php

PUBLICATIONS¹

CONFERENCE PAPERS

2022 **Fluid Zoomable User Interface: A Uniform User Interface for the Multi-Screen World**

D. Kutas, J. Jones, D. Denenberg

2020 **Linecept: An Early Prototype of a Timeline-Based Design Coordination Tool**

D. Kutas, A. Nair, P. Singh, E. Kan, J. Burge, A. van der Hoek

¹ Google Scholar citations as of January, 2025: 82, h-index: 3, i10-index: 2.

In Proceedings of the IEEE/ACM 42nd International Conference on Software Engineering Workshops (ICSEW'20). Association for Computing Machinery, New York, NY, USA, 129–132. DOI:
<https://doi.org/10.1145/3387940.3392228>

- 2016 **Subsea Blowout Source Control Technologies Utilized at the Macondo Accident and Developments in the Post-Macondo Era**
D. Kutas, P. Bailey, M. Prohaska-Marchried
SPE Bergen One Day Seminar, Grieghallen, Bergen, Norway. DOI:
<https://doi.org/10.2118/180018-MS>
- 2015 **A Study of the Applicability of Bourgoyne and Young ROP Model and Fitting Reliability Through Regression**
D. Kutas, A. Nascimento, A. Elmgerbi, A. Roohi, M. Prohaska, G. Thonhauser, M. Mathias
International Petroleum Technology Conference, Doha, Qatar. DOI:
<https://doi.org/10.2523/IPTC-18521-MS>

JOURNAL PAPERS

- 2015 **Mathematical Modeling applied to Drilling Engineering: An Application of Bourgoyne and Young ROP Model to a Presalt Case Study**
A. Nascimento, D. Kutas, A. Elmgerbi, G. Thonhauser, M. Mathias
Mathematical Problems in Engineering, Hindawi, DOI:
<https://doi.org/10.1155/2015/631290>

DOCTORAL SYMPOSIUM

- 2021 **Taking Digital Product Design Coordination to the Next Level by Elastic Zooming and Linecept**
D. Kutas
In Adjunct Publication of the 34th Annual ACM Symposium on User Interface Software and Technology (UIST '21). Association for Computing Machinery, New York, NY, USA, 179–182. DOI:
<https://doi.org/10.1145/3474349.3477592>

TALKS

- 2022 **Fluid Zoomable User Interface and Its Application in a Temporal and Hierarchical Information Visualization Infrastructure**
D. Kutas

Adobe Research, Adobe Systems, San Jose

- 2022 **Revolution in Visual Communication: User Interfaces**
D. Kutas
Hungarian Innovators of Silicon Valley, online
- 2021 **Elastic Zoomable User Interface and Its Application in a Temporal and Hierarchical Visualization Infrastructure**
D. Kutas
Dissertation topic proposal, University of California, Irvine
- 2021 **Taking Digital Product Design Coordination to the Next Level by Elastic Zooming and Linecept**
D. Kutas
34th Annual ACM Symposium on User Interface Software and Technology (UIST '21). Association for Computing Machinery, online
- 2021 **Elastic Zooming: Enabling a Single User Interface for the Multi-Device World**
D. Kutas
Advancement to candidacy and MS.c. thesis defense presentation, University of California, Irvine
- 2020 **Linecept: An Early Prototype of a Timeline-Based Design Coordination Tool**
D. Kutas
IEEE/ACM 42nd International Conference on Software Engineering Workshops (ICSEW'20). Association for Computing Machinery, online
- 2018 **Extraterrestrial Drilling**
D. Kutas, A. Koulidis, M. Stancu
20th Mars Society Annual Convention, Irvine, CA, USA

POSTERS

- 2016 **Extraterrestrial Drilling**
D. Kutas, A. Koulidis, M. Stancu
Student Technical Conference 2016, Society of Petroleum Engineers German Chapter, Wietze, Germany
- 2016 **Real-Time Fluid Influx Detection with Ultrasonic Sensing**
D. Kutas
Student Congress of Petroleum Engineering 2016, Society of Petroleum

Engineers Austrian Chapter, Leoben, Austria

2014 **Operation Analysis of the Big Wind (Poster)**

D. Kutas

Student Technical Conference 2014, Society of Petroleum Engineers German Chapter, Wietze, Germany

2013 **Future of the Hungarian Geothermal Energy Development and Utilization (Poster)**

D. Kutas, M. Zsemko

Student Technical Conference 2013, Society of Petroleum Engineers German Chapter, Wietze, Germany

DEMOS

2022 **Linecept: A Product Design Coordination Tool Using Fluid Zoomable User Interface**

D. Kutas

35th Annual ACM Symposium on User Interface Software and Technology (UIST '21). Association for Computing Machinery, New York, NY, USA.

TEACHING EXPERIENCE

2022 **Analysis of Programming Languages**

Information and Computer Science, Graduate Class, Reader, University of California, Irvine

2022 **Software Testing and Analysis**

Master of Software Engineering Program, Graduate Class, Teaching Assistant, University of California, Irvine

2021 **Graphical User Interface Programming**

Master of Software Engineering Program, Graduate Class, Teaching Assistant, University of California, Irvine

2021 **Web Programming**

Master of Software Engineering Program, Graduate Class, Teaching Assistant, University of California, Irvine

2021 **Interactive Technology Studio**

Master of Human-Computer Interaction and Design Program, Graduate Class,

Teaching Assistant, University of California, Irvine

2021 **Software Testing and Analysis**

Master of Software Engineering Program, Graduate Class, Teaching Assistant, University of California, Irvine

2020 **Web Programming**

Master of Software Engineering Program, Graduate Class, Teaching Assistant, University of California, Irvine

2019 **Information Visualization**

Informatics/Software Engineering Program, Undergraduate Class, Teaching Assistant, University of California, Irvine

2019 **Requirements Engineering**

Informatics/Software Engineering Program, Undergraduate Class, Teaching Assistant, University of California, Irvine

2018 **Software Design**

Informatics/Software Engineering Program, Undergraduate Class, Teaching Assistant, University of California, Irvine

ACADEMIC COURSE AND DEVELOPMENT

2022 **Front End Programming**

University of California, Irvine

Graduate course development including theoretical grounding and coding assignments for the Master of Software Engineering Program at the University of California, Irvine.

GUEST LECTURES

2024 **Review of User Interface Development Technologies**

Internet Applications Engineering (INF-124/COMPSCI-137) at the University of California, Irvine

HUMAN SUBJECT RESEARCH

2020-2022 **User Assessment of a Highly Visual Software Environment for Information Manipulation and Collaboration**

Office of Research, Institutional Review Board, University of California,
Irvine. Approval number: UCI IRB HS# 2020-6287

FUNDING AND HONORS & AWARDS

- 2018-2022 **Ph.D. Fellowship**
University of California, Irvine
Paid tuition and full support package 52,433 USD/year for 4 years. Altogether roughly 209,732 USD.
- 2021 **Master of Human-Computer Interaction and Design Fellowship**
University of California, Irvine
Awarded to one Ph.D. student in an academic year who demonstrates excellence in supporting graduate students in their coursework (7,500 USD).
- 2020 **Teaching Excellence and Innovation Fellowship**
Division of Teaching and Learning, University of California, Irvine
Awarded to scholars who successfully finished all the required modules in the Teaching Excellence and Innovation program (5,000 USD).
- 2018 **Chair's Award**
Department of Informatics, University of California, Irvine
Awarded to exceptionally promising scholars in the Department of Informatics at the University of California, Irvine (2,500 USD).
- 2014-2016 **Excellence Scholarship**
OMV and Montanuniversitaet Leoben, Austria
Awarded to the top 10% applicants (approximately 10 out of 100) in an academic year who demonstrate excellent academic results throughout their undergraduate studies (1,000 EUR/month for 2 academic years, overall approximately 18,000 EUR).

CERTIFICATIONS

- 2020 **Certification in Remote Instruction**
Division of Teaching and Learning, University of California, Irvine, CA, USA
- 2018 **Certification in Human Subject Research (Social/Behavioral Investigators)**
Collaborative Institutional Training Initiative (CITI), Fort Lauderdale, FL, USA

2015 **Certification in Intercultural Awareness**
Beratergruppe Neuwaldegg, Vienna, Austria

ACADEMIC SERVICE

- 2025 **Conference on International Conference on Intelligent User Interfaces Demo and Poster Reviewer**
ACM Conference on Intelligent User Interfaces (ACM IUI)
- 2024 **Conference on International Conference on Intelligent User Interfaces Demo and Poster Reviewer**
ACM Conference on Intelligent User Interfaces (ACM IUI)
- 2023 **Conference on Designing Interactive Systems (DIS) Paper Reviewer**
ACM Designing Interactive Systems (ACM DIS)
- 2022 **Conference on Human Factors in Computing Systems (CHI) Paper Reviewer**
ACM CHI Conference on Human Factors in Computing Systems (ACM CHI)
- 2022-2023 **Conference on Computer-Supported Cooperative Work And Social Computing(CSCW) Paper Reviewer**
ACM Conference On Computer-Supported Cooperative Work And Social Computing (ACM CSCW)

LEADERSHIP EXPERIENCE AND COMMUNITY INVOLVEMENT

- 2020-ongoing **Member**
Association of Computing Machinery, New York, NY, USA
- 2010-2016 **Student Member**
Society of Petroleum Engineers, Houston, TX, USA
- 2013-2014 **Editor**
Neumann Society, San Francisco, CA, USA
- 2010-2013 **News Writer and Editor, Website Designer**
Bankut Ski Club, Hungary
- 2009 **Co-organizer**

First scuba diving expedition to the SMS Kaiser Franz Joseph I., in Montenegro.

STUDENTS MENTORED

- 2020 **Lawrence Hwang**
Undergraduate student, now at Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA.
- 2020 **Andres Garcia**
Undergraduate student, now at VMware, Inc.
- 2019 **Omar Valenzuela**
Undergraduate student, now at Chan-Zuckerberg Initiative.

PUBLIC SOFTWARE & HARDWARE DEVELOPMENT

- 2022-ongoing **Visa Chart Components**
Link: <https://visa.github.io/visa-chart-components/?path=/story/bar-chart--default>
Visa Chart Components (VCC) is an accessibility focused, framework agnostic set of data experience design system components for the web, enabling developers to build equal data experiences for everyone, everywhere. VCC is provided under the MIT license.
- 2015-2023 **Linecept**
A design coordination software tool. Based on Fluid Zoomable User Interface.
- 2021 **React Browser Navigator - Node Package**
Link: <https://www.npmjs.com/package/react-browser-navigator>
An open-source software that web application developers can integrate into their projects so they can get information about their users. Information includes geographic location, device type, used languages on the device. The software has been downloaded more than 5,000 times since its initial release.
- 2017-2018 **Alpine Ski Design for the 2018 PyeongChang Winter Olympic Games**
Designed alpine skis for the PyeongChang Winter Olympic Games. The skis were used by Marton Kekesi, OLY at the winter olympic games in slalom and giant slalom disciplines.
- 2014-2015 **Department of Petroleum Engineering Website**
Link: <https://dpe.ac.at/>

Montanuniversitaet Leoben, Austria

- 2015 **Website and Geographic Information System (GIS) for a Private Non-Profit Database of Hungarian Raw Materials**
Link: <http://asvanykincs.hu/map-atekinto/>
Asvanykincs.hu, Hungary
- 2013-2015 **Website Building for Various Schools and Departments**
University of Miskolc, Hungary
- 2009-2013 **Website and Ticket Handling System for Ski Resort**
Bankut Ski Club, Hungary
- 2009-2013 **Prezi Presentations for Various University Entities**
University of Miskolc, Hungary
- 2009 **Waterproof IP Camera and Weather Station System**
Bankut Ski Club, Hungary
- 2009 **Safety Knife Design**
Smith & Wesson, Springfield, Massachusetts, USA

SKILLS

- Design **Algorithm development, computer aided design, data visualization, design language development, design thinking, finite element modeling, fluid dynamics modeling, font family integration, graphical user interface components, human-in-the-loop AI system design, node package manager package analysis and security assessment, software testing, system and micro animations, user interaction design, user interface metaphors, user interface physics.**
- Software **Adobe Creative Suite (Photoshop, Illustrator, XD, After Effects), Amazon Mechanical Turk Crowdsourcing Platform, Ansys, Apple macOS, Astro, AutoCAD, AWS (Cognito, EC2, Elastic Beanstalk, S3, VPC, Route53), Balsamiq, Express, Figma, FigJam, Framer Motion, Git, GitHub, GreenSock Animation Platform, jQuery, Linux, LLM APIs and protocols, Microsoft Office Suite, Microsoft Windows, MockFlow, MongoDB, NextJS, Ngnix, Node, NPM, NPM Packages, PIXI.js, Qualtrics, React, Redux, Snowpack, Svelte, Vite, Webpack, WordPress CMS.**
- UX Design & Evaluation **Cognitive walkthrough, heuristic evaluation, human subject research protocols, hypothesis testing, multivariate statistical modeling (linear,**

logistic, ordinal), sketching, survey design, user interviews, wireframing, Wizard-of-Oz.

Programming **AI-driven development, Artificial intelligence toolkits, LLM workflows, machine learning workflows, HTML, CSS, JavaScript, RESTful API, CanvasAPI, WebGL, WebGPU.**

Hardware **Raspberry Pi and its accessories, ultrasonic sensors, alpine ski geometry design.**

PRESS

2018 **Multiple Articles About Alpine Ski Design**

Reference 1: https://en.wikipedia.org/wiki/M%C3%A1rton_K%C3%A9kesi#

Reference 2: <https://sielok.hu/rovat/silec/cikk/kekesi-marton-explosiv/>