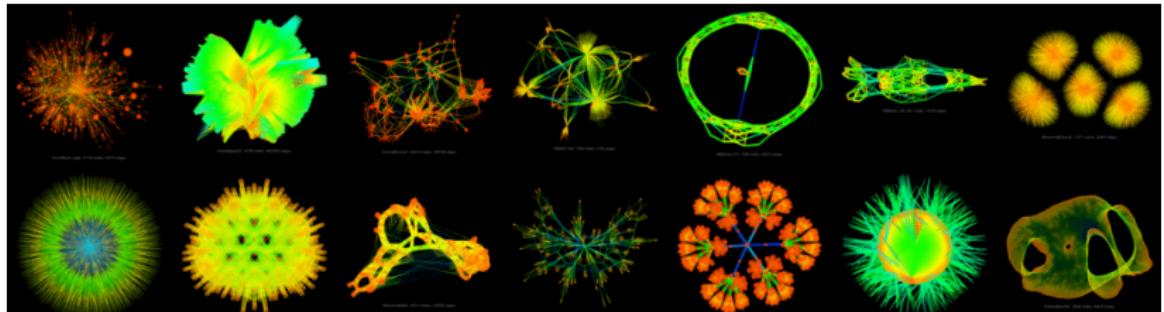


A Brief Introduction

Stephen Kobourov
University of Arizona

12 August 2022, University of Copenhagen



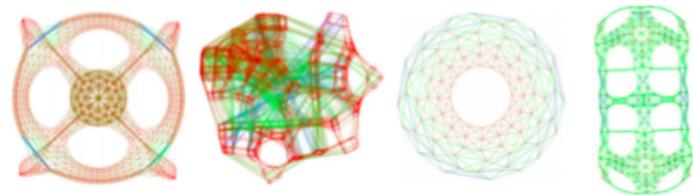


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Professor
Computer Science
University of Arizona

Multi-Persp. Sim. Emb. [INFOVIS'20]



T-SNET layout [EuroVis'17]



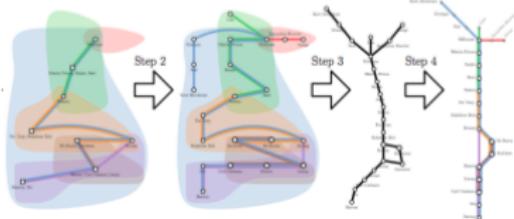
Cartograms [EuroVis'16]



GMap visualization [INFOVIS'14]



MetroSets [INFOVIS'20]



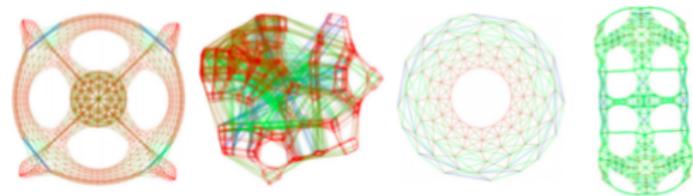


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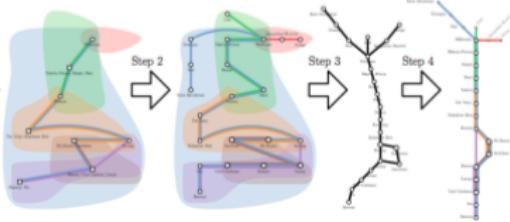
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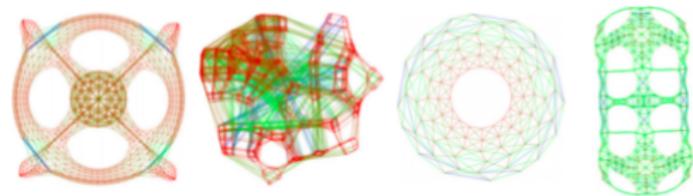


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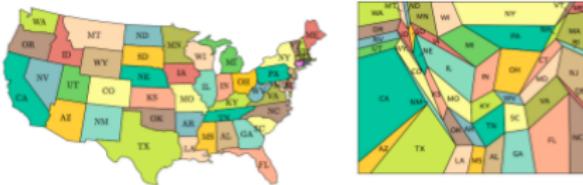
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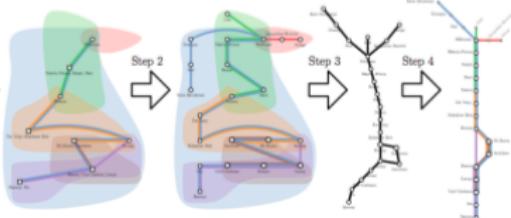
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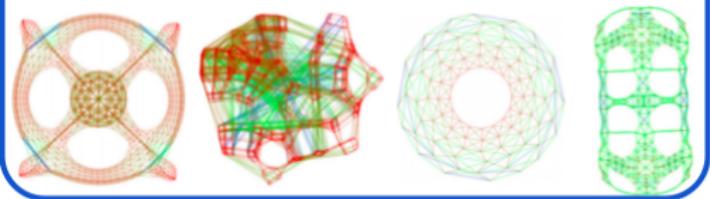


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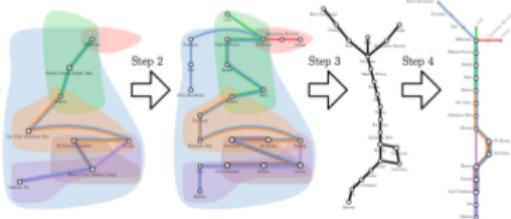
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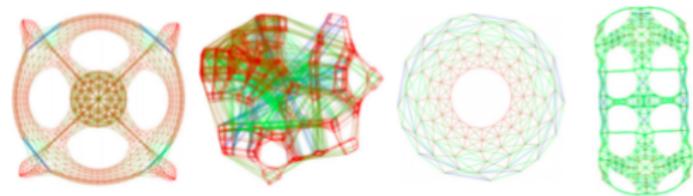


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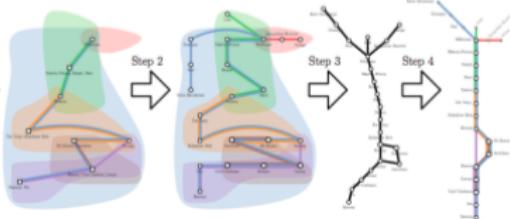
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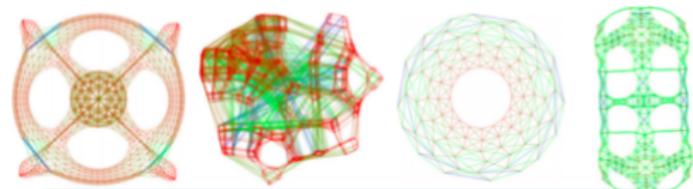


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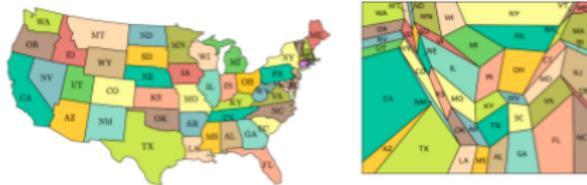
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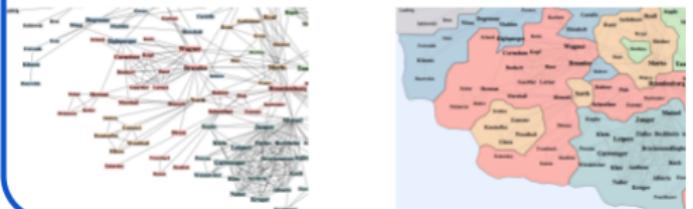
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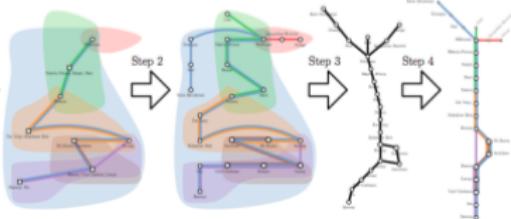
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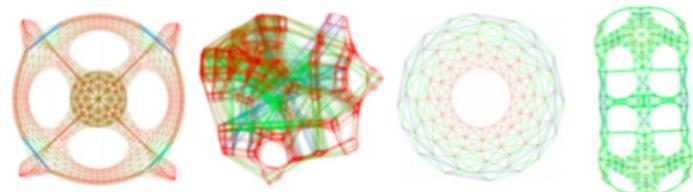


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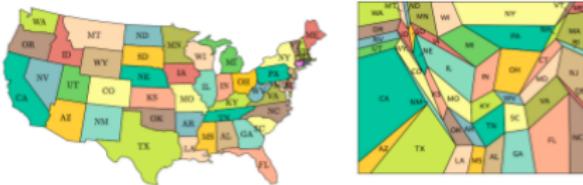
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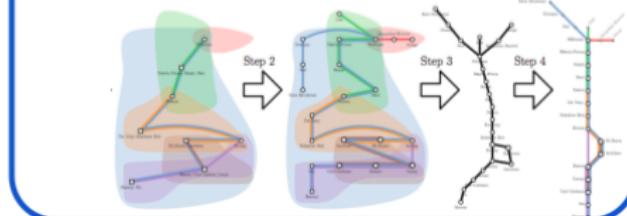
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Scientific background and research

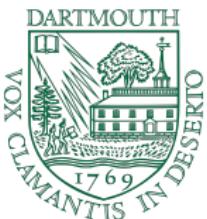
Scientific Background

- 1995 BS in CS, Math (double major), Classics (minor), **Dartmouth College**
- 2000 PhD in CS (thesis: Visualization of Large Graphs), **Johns Hopkins University**



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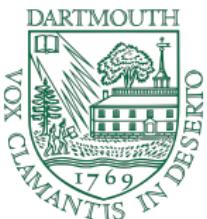
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- 2000-2006, Assistant Professor of Computer Science, **University of Arizona**
- 2006-2012, Associate Professor of Computer Science, **University of Arizona**
- 2012-present, Full Professor of Computer Science, **University of Arizona**

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- 2000-2006, Assistant Professor of Computer Science, **University of Arizona**
- 2006-2012, Associate Professor of Computer Science, **University of Arizona**
- 2012-present, Full Professor of Computer Science, **University of Arizona**

But also...

- 2006-2007 Fulbright Scholar, Computer Science, University of Botswana
- 2008-2009 Research Scientist, AT&T Research Labs, Florham Park, NJ
- 2011-2012 Alexander von Humboldt Fellow, Universität Tübingen, Germany
- 2015-2016 Fulbright Distinguished Chair, Charles University, Prague



Alexander von Humboldt
Stiftung/Foundation



AT&T
Bell Laboratories

Research Interests: Theory and Practice

Research Interests: Theory and Practice

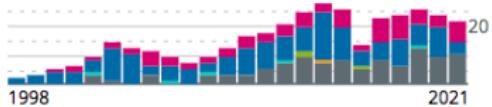


[+] Stephen G. Kobourov [+]

Research Interests: Theory and Practice



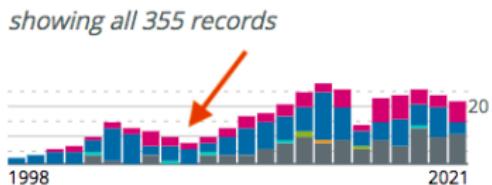
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Research Interests: Theory and Practice



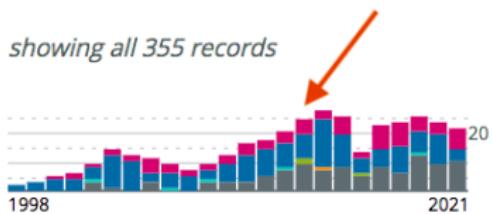
[+] Stephen G. Kobourov [i] [↑] [↓] [←] [→] [?] [msg]



Research Interests: Theory and Practice



[+] Stephen G. Kobourov [i] [a] [d] [e] [m]

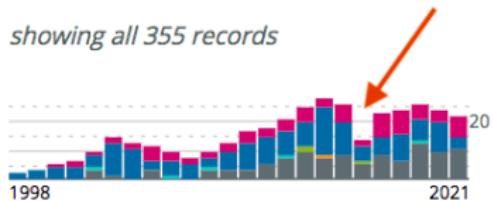


Research Interests: Theory and Practice



[+] Stephen G. Kobourov [+]

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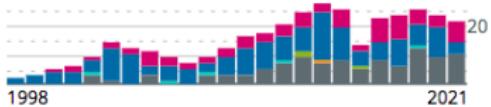
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[+] Stephen G. Kobourov [+]

- Graph Drawing (72)
- J. Graph Algorithms Appl. (20)
- IEEE Trans. Vis. Comput. Graph. (14)
- Comput. Graph. Forum (7)
- PacificVis (7)
- EuroVis (5)

showing all 355 records



Research Interests: Theory and Practice



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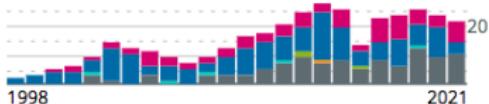
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Comput. Geom. (10)

WG (8)

Algorithmica (8)

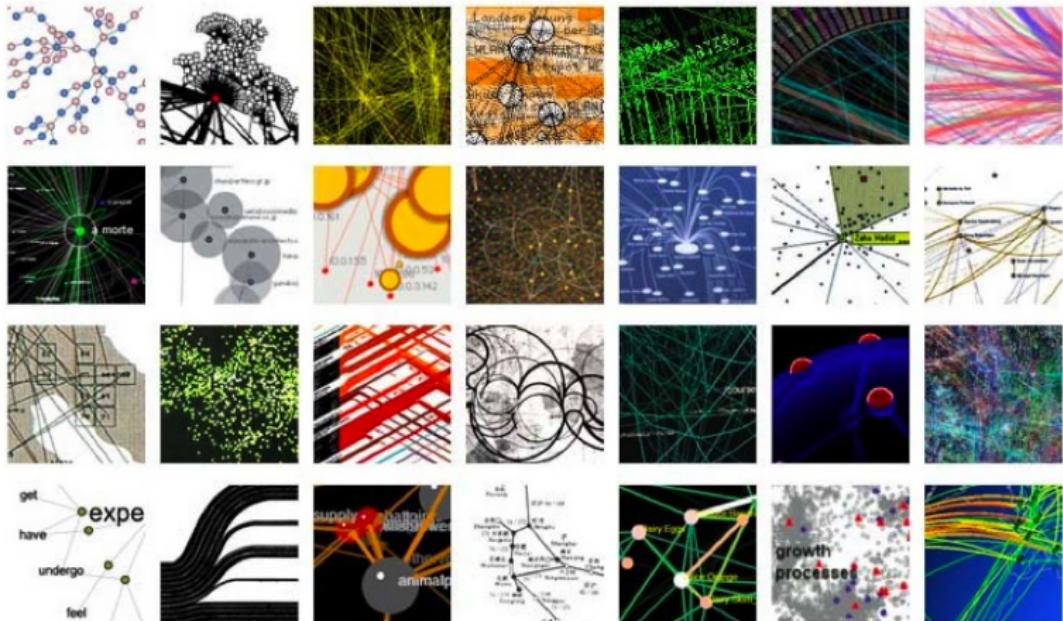
ESA (5)

ISAAC (5)

SEA (4)

SODA (3)

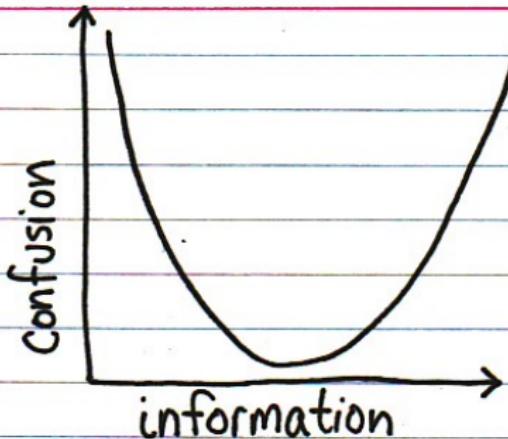
All Vis, All the Time?



All Vis, All the Time?

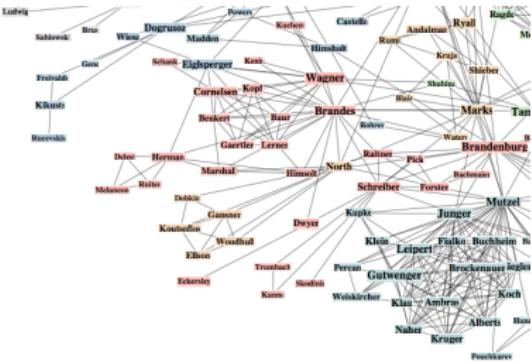


Less is More



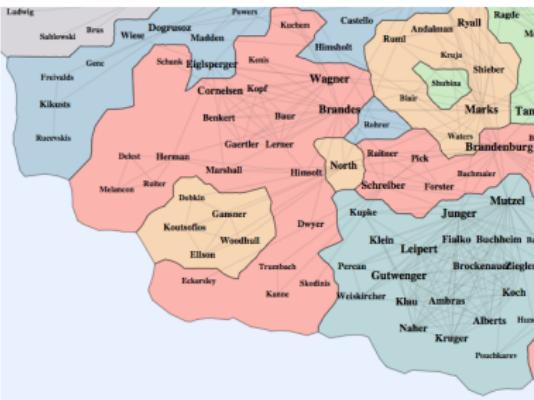
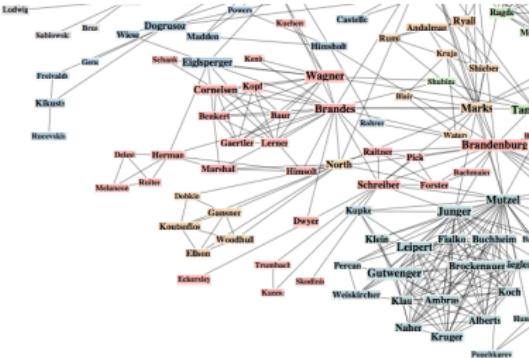
Why Maps?

- Dimensionality reduction:
 $\mathcal{R}^n \rightarrow \mathcal{R}^2$



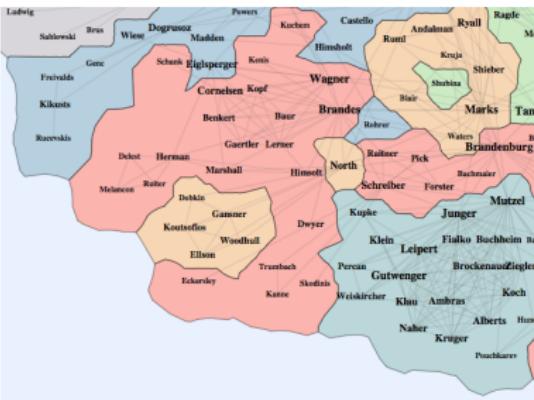
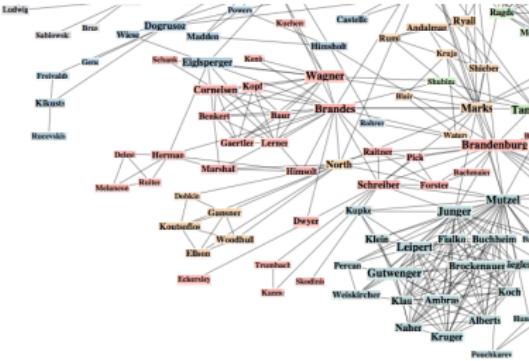
Why Maps?

- Dimensionality reduction:
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- Natural extension



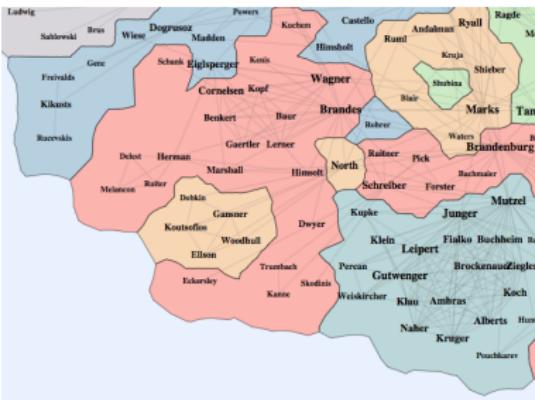
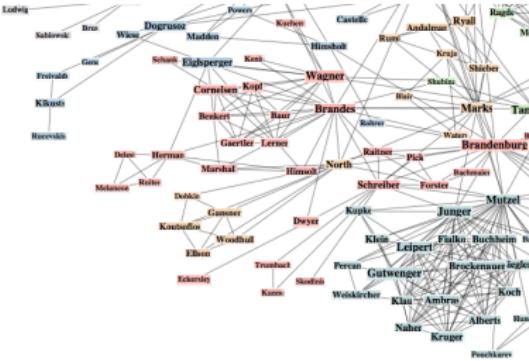
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- Dimensionality reduction:
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- Natural extension
- Explicit clustering



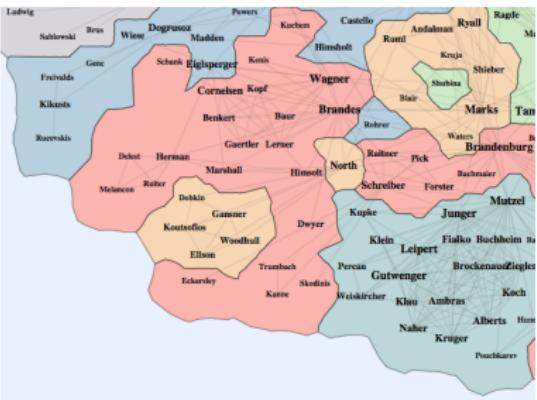
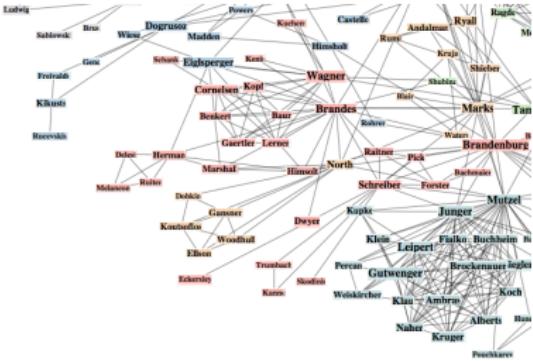
Why Maps?

- Dimensionality reduction:
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- Natural extension
- Explicit clustering
- Intuitive and familiar



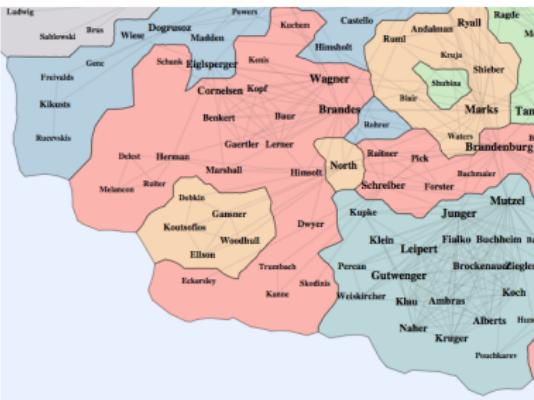
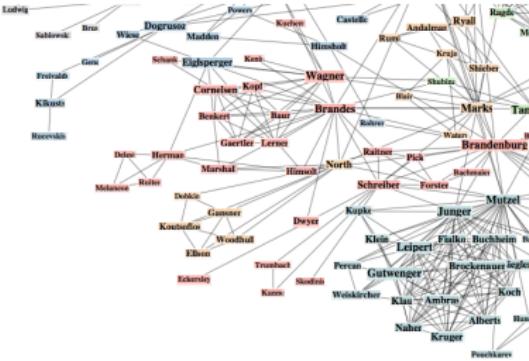
Why Maps?

- Dimensionality reduction:
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- Natural extension
- Explicit clustering
- Intuitive and familiar
- More engaging



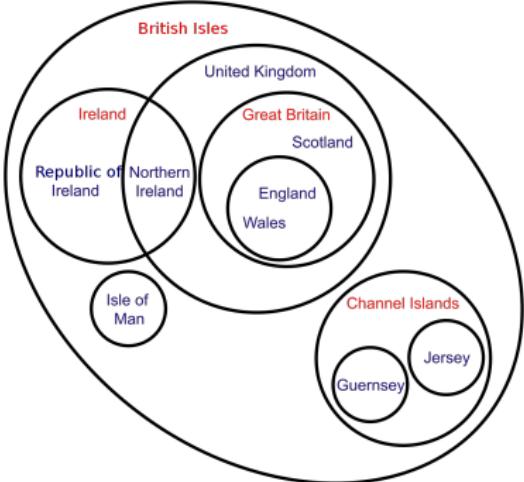
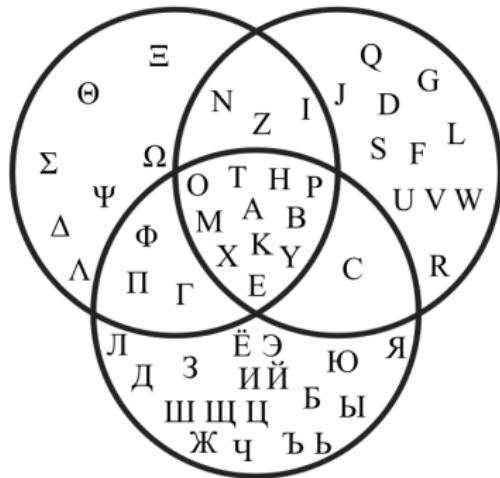
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- Natural extension
- Explicit clustering
- Intuitive and familiar
- More engaging
- Better recall

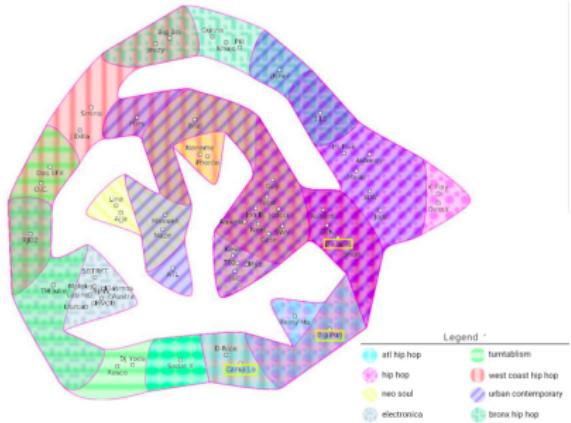


If Graphs are Maps, then Hypergraphs Are...?

Classical hypergraph (set system) visualizations: Venn and Euler diagrams



Good in Theory, but in Practice...

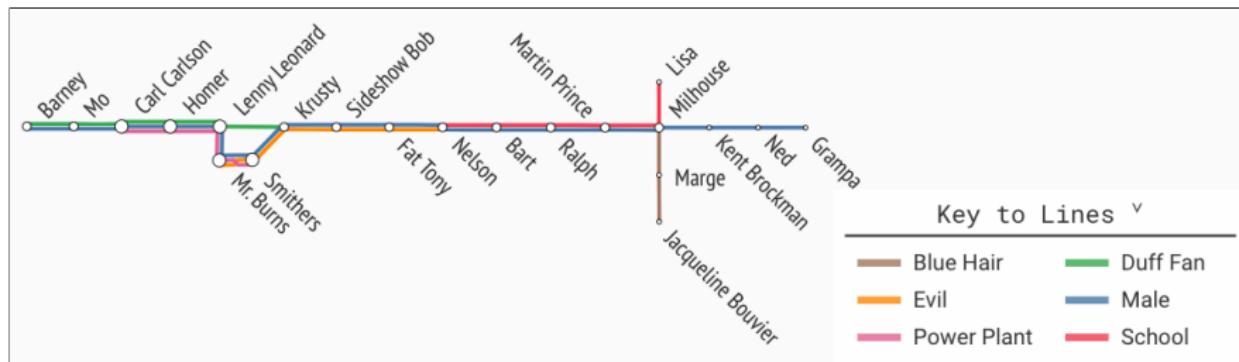


If Graphs are Maps, then Hypergraphs Are MetroMaps

MetroMap Metaphor

- nodes (elements) are stations
- hyperedges (sets) are lines
- interchanges are elements in multiple sets

Example: “The Simpsons” hypergraph (21 nodes, 6 hyperedges)



Research plan and scientific vision

Research Plan: (1) Funding

Primary Investigator

- *Algorithms for Geometric Graphs* (2022-26), NSF, \$800,000
- *Multi-Level Graph Representation for Exploring Big Data* (2018-22), NSF, \$600,000
- *Algorithms for Geometric Graph Representations* (2017-21), NSF, \$450,000
- *Putting Network Security on the Map* (2011-16), Office of Naval Research, \$4,157,490
- *ImageQuest: Calibrated Imaging and Validated Analysis* (2010-13) NSF, \$1,268,593
- *CAREER: Embedding, Morphing and Visualizing Dynamic Graphs* (2006-11), NSF, \$419,645
- *Algorithms for Visualizing Data with Contact Graphs*, (2011-14), NSF, \$296,001
- *Visualization of Giga-Graphs and Graph Processes*, (2002-05), NSF, \$240,358

Co-PI

- *Building Theoretical Foundations for Data Sciences* (2017-22), NSF, \$1,368,500
- *Data Science Pathways for Vibrant TRIPODS Commons at Scale* (2018-21), NSF, \$200,000
- *Collaborative Mind-Mapping for the Obesity Challenge* (2010-2012), USDA, \$500,000



Research Plan: (2) Relevant Research Topics

- Multi-level representation and semantic zooming for visualization and interaction



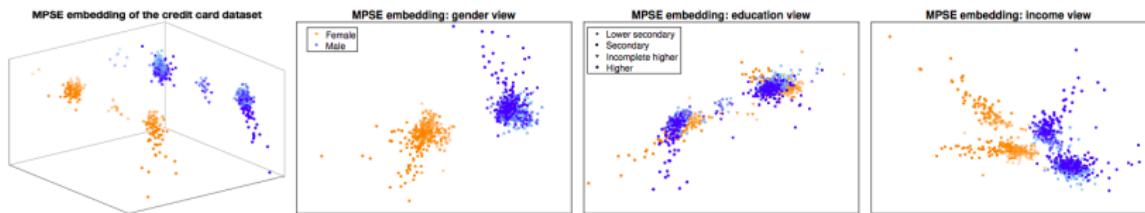
- Non-Euclidean visualization of graphs, hypergraphs and knowledge graphs



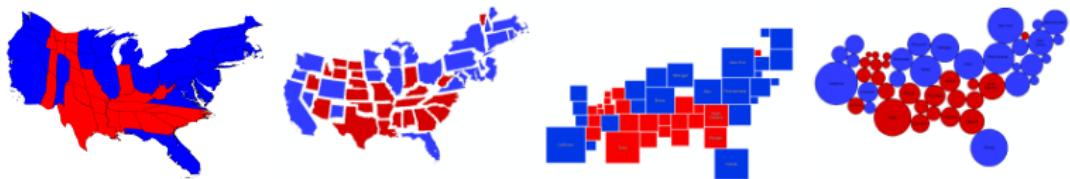
- Visualizing/interacting with graphs, hypergraphs, knowledge graphs in VR and AR
 - Perception issues in visualization

Research Plan: (2) Relevant Research Topics

- Interpretable dimensionality reduction for machine learning, data science



- GeoVIS, such as maps and cartograms



- Modeling, visualization, and explanation for natural language
- Modeling, generation, and explanation of animal trajectories

Research Plan: (3) Collaborations

- Research collaborations within my department: 10 out of 20 of my colleagues (visualization, HCI, algorithms, compilers, prog. languages, security, HPC, NLP, CS ed.)

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2	 Carlos Acedo	[c116] [c97]
3	 Abu Reyan Ahmed	[j83] [c160] [c159] [i101] [i100] [i99] [i97] [i94] [j74] [j73] [c156] [c155] [c149] [i92] [i91] [i88] [j71] [c145] [c142] [i82] [i81] [i78] [i75] [c134] [c133] [i71] [i65]
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- Research collaborators in 40+ countries: USA, Canada, Mexico, Brazil, Japan, Korea, Oman, Taiwan, China, Australia, New Zealand, India, Iran, Bangladesh, Nepal, Vietnam, England, Scotland, Wales, Germany, Austria, Switzerland, Italy, France, Luxembourg, Spain, Netherlands, Chechia, Slovakia, Sweden, Finland, Turkey, Cyprus, Israel, Poland, Ukraine, Russia, Armenia, Romania, Hungary, Greece

Research Plan: (4) Build Things

Graph And Map Algorithms (GAMA) Group



Home

Members

Publications

Projects

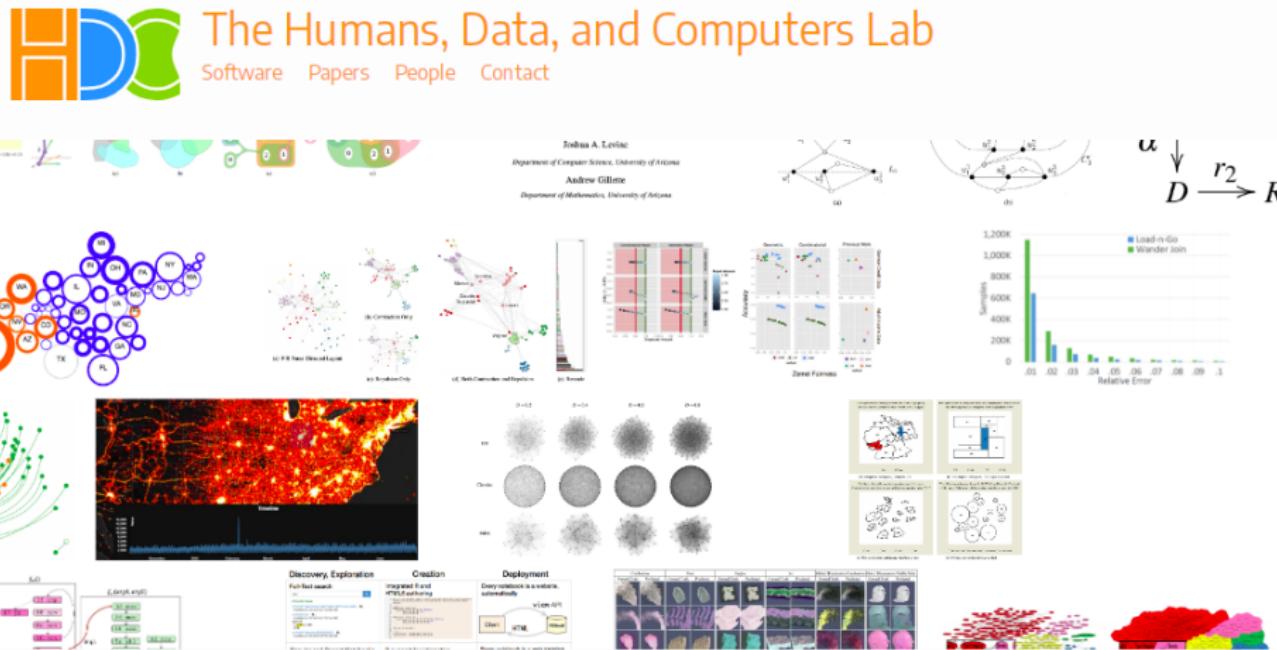
Contacts



About GAMA

Our research interests are centered on graph theory, computational geometry, and information visualization. We like to draw graphs and maps.

Research Plan: (4) Build Things

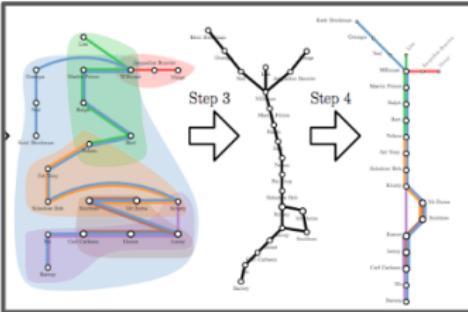


At the HDC Lab, we study how computer science interacts with human experiences, at all levels. We specialize in novel algorithms for interactive visualization and exploratory data analysis. This ranges from creating [mathematical foundations for the evaluation of visualization designs](#), to [novel data structures and systems for interactive data analysis at scale](#), to [novel ways to characterize data-driven discrimination](#), to [topological analysis in visualization](#).

Research Plan: (4) Build Things



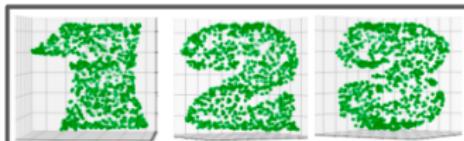
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metrossets.ac.tuwien.ac.at



gmap.cs.arizona.edu



mpse.arl.arizona.edu



sites.google.com/site/twitter4food



lombardi.cs.arizona.edu

Research Plan: (5) Postdocs and Students

My Current Group



Kiana Thatcher
MS student



Rahat Zaman
PhD student



Jacob Miller
PhD student



Harshita Narnoli
PhD student



Myroslav Kryven
postdoc



Markus Wallinger
postdoc



Iqbal Hossain
postdoc

Teaching experience, competences

Teaching: Advising Postdocs (17)

- Careers in Academia



Rado Fulek
(Stanford)



Nina Zweig
(Kaiserslautern U.)



Keaton Hamm
(U. Texas)



Aparna Das
(LeMoyne)



Carsten Görg
(U. Colorado)



Vahan Huroyan
(U. Missouri)

- Careers in Industry



Sergey Pupyrev
(Facebook)



Felice de Luca
(Apple)



Joe Fowler
(Modular)



(Intel)



Raymundo Navarrete
(Upstart)



Faryad Sahneh
(Flagship)

Teaching: Advising PhD Students (12)

- Careers in Academia



Sabrina Nusrat
(Harvard postdoc)



Richard Spence
(Ben Gurion postdoc)



Reyan Ahmed
(Colgate Prof.)



Cesim Erten
(Antalya Prof.)

- Careers in Industry



Jawaherul Alam
(Amazon)



Alejandro Balderrama
(Google)



Sankar Veeramoni
(IBM)



Ryn Gray
(Sandia)

Teaching: Advising High School and BS Students (40+)¹

- Getting PhDs



Scott Emmons
(Berkeley)



Ben Jacobsen
(Wisconsin)



Katie Cunningham
(Northwestern)



Fabian Frank
(TU Munich)



Lukas Barth
(Karlsruhe IT)

- Careers in Academia and Industry



Daniel Fried
(Prof. CMU)



Noah Snavely
(Prof. Cornell)



Martin Stepp
(Stanford)



Steve Bethard
(Prof. Arizona)



Amanda Wixted
(Apple)

¹6/20 most cited papers are with high school or BS students as co-authors

Teaching: Educational Tools

I have built educational tools to enhance student learning, to provide interactive student experiences, and to offer non-traditional homework assignments.²

[A] S. Bridgeman, M. Goodrich, S. Kobourov, R. Tamassia, "PILOT: An interactive tool for learning and grading," *31st ACM Technical Symposium on Computer Science Education (SIGCSE)*, p. 139-143, 2000. (129 citations)

[B] S. Bridgeman, M. Goodrich, S. Kobourov, R. Tamassia, "SAIL: A System for Generating, Archiving, and Retrieving Specialized Assignments Using L^AT_EX," *31st ACM Technical Symposium on Computer Science Education (SIGCSE)*, p. 300-304, March 2000. (29 citations)

[C] C. Collberg, S. Kobourov, S. Westbrook, "AlgoVista: An Algorithmic Search Tool in an Educational Setting," *35st ACM Technical Symposium on Computer Science Education (SIGCSE)*, p. 462-466, 2004. (5+5 citations)

²The citations counts are from google scholar accessed 17/07/22.

Teaching: Courses³

- I teach 2 courses per year
- Usually PhD-level research seminars, but also large BS-level classes

³I can provide more info, as my teaching materials were missing from the application

Teaching: Courses³

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- Below is a sample from 3 recent official course evaluations
 - CSc 473, Fall 2019, *Automata, Grammars and Languages*
 - CSc 573, Fall 2020, *Theory of Computation*
 - CSc 696, Spring 2021, *Algorithmic Data Visualization*

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- As chair of the department's Evaluations Committee for the last decade, I highlight the scores for questions that the committee pays attention to

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 - Q1: *"I was treated with respect in this course"*
(4.66/5, 4.77/5, 5/5)

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(4.66/5, 4.77/5, 5/5)
 - Q3: "*This course expanded my knowledge and skills in this subject matter*"
(4.68/5, 5/5, 5/5)

³I can provide more info, as my teaching materials were missing from the application

Teaching: Courses³

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(4.66/5, 4.77/5, 5/5)
 - Q3: "*This course expanded my knowledge and skills in this subject matter*"
(4.68/5, 5/5, 5/5)
 - Q8: "*Course presentations, materials, procedures, deadlines clearly organized*"
(4.40/5, 4.77/5, 4.6/5)

³I can provide more info, as my teaching materials were missing from the application

Teaching: Courses³

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(4.66/5, 4.77/5, 5/5)
 - Q3: "*This course expanded my knowledge and skills in this subject matter*"
(4.68/5, 5/5, 5/5)
 - Q8: "*Course presentations, materials, procedures, deadlines clearly organized*"
(4.40/5, 4.77/5, 4.6/5)
 - Q12: "*The course material and activities helped me learn in this course*"
(4.31/5, 4.55/5, 4.6/5)

³I can provide more info, as my teaching materials were missing from the application

Courses 1-4

Title: *Algorithmic Data Visualization*

Language: English

ECTS points: 3

Number of students: 10-20

Educational Level: MS and PhD

Role: class teacher

Teaching Form: lectures, presentations, project supervision

Number of times: 3 times at Arizona
(2021, 2019, 2017)

Courses 1-4

Title: *Algorithmic Data Visualization*

Language: English

ECTS points: 3

Number of students: 10-20

Educational Level: MS and PhD

Role: class teacher

Teaching Form: lectures, presentations, project supervision

Number of times: 3 times at Arizona
(2021, 2019, 2017)

Title: *Information Visualization*

Language: English

ECTS points: 3

Number of students: 15-20

Educational Level: MS and PhD

Role: class teacher

Teaching Form: lectures, presentations, project supervision

Number of times: 4 times at Arizona
(2018, 2016, 2003, 2001)

Courses 1-4

Title: *Algorithmic Data Visualization*
Language: English
ECTS points: 3
Number of students: 10-20
Educational Level: MS and PhD
Role: class teacher
Teaching Form: lectures, presentations, project supervision
Number of times: 3 times at Arizona
(2021, 2019, 2017)

Title: *Design & Analysis of Algorithms*
Language: English
ECTS points: 3
Number of students: 40-60
Educational Level: MS and PhD
Role: class teacher
Teaching Form: classroom teaching, lectures, grading
Number of times: 4 times at Arizona
(2017, 2016, 2005, 2004)

Title: *Information Visualization*
Language: English
ECTS points: 3
Number of students: 15-20
Educational Level: MS and PhD
Role: class teacher
Teaching Form: lectures, presentations, project supervision
Number of times: 4 times at Arizona
(2018, 2016, 2003, 2001)

Courses 1-4

Title: *Algorithmic Data Visualization*
Language: English
ECTS points: 3
Number of students: 10-20
Educational Level: MS and PhD
Role: class teacher
Teaching Form: lectures, presentations, project supervision
Number of times: 3 times at Arizona (2021, 2019, 2017)

Title: *Design & Analysis of Algorithms*
Language: English
ECTS points: 3
Number of students: 40-60
Educational Level: MS and PhD
Role: class teacher
Teaching Form: classroom teaching, lectures, grading
Number of times: 4 times at Arizona (2017, 2016, 2005, 2004)

Title: *Information Visualization*
Language: English
ECTS points: 3
Number of students: 15-20
Educational Level: MS and PhD
Role: class teacher
Teaching Form: lectures, presentations, project supervision
Number of times: 4 times at Arizona (2018, 2016, 2003, 2001)

Title: *Experimental Algorithmics*
Language: English
ECTS points: 3
Number of students: 15-20
Educational Level: MS and PhD
Role: class teacher
Teaching Form: lectures, presentations, project supervision
Number of times: 2 times at Arizona (2013, 2006)

Courses 5-8

Theory of Computation

Language: English

ECTS points: 3

Number of students: 40-60

Educational Level: MS and PhD

Role: class teacher

Teaching Form: classroom teaching,
lectures, grading

Number of times: 5 times at Arizona
(2020, 2017, 2014, 2006, 2002)

Courses 5-8

Theory of Computation

Language: English

ECTS points: 3

Number of students: 40-60

Educational Level: MS and PhD

Role: class teacher

Teaching Form: classroom teaching,
lectures, grading

Number of times: 5 times at Arizona
(2020, 2017, 2014, 2006, 2002)

Geometric Graph Representation

Language: English

ECTS points: 3

Number of students: 20-30

Educational Level: BS and MS

Role: class teacher

Teaching Form: classroom teaching,
lectures, grading

Number of times: 1 time at Charles
University in Prague (2015)

Courses 5-8

Theory of Computation

Language: English

ECTS points: 3

Number of students: 40-60

Educational Level: MS and PhD

Role: class teacher

Teaching Form: classroom teaching,
lectures, grading

Number of times: 5 times at Arizona
(2020, 2017, 2014, 2006, 2002)

Introduction to Algorithms

Language: English

ECTS points: 3

Number of students: 80-120

Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
lectures, TA supervision

Number of times: 5 times at Arizona
(2022, 2011, 2010, 2004, 2003)

Geometric Graph Representation

Language: English

ECTS points: 3

Number of students: 20-30

Educational Level: BS and MS

Role: class teacher

Teaching Form: classroom teaching,
lectures, grading

Number of times: 1 time at Charles
University in Prague (2015)

Courses 5-8

Theory of Computation

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Geometric Graph Representation

Language: English

ECTS points: 3

Number of students: 20-30

Educational Level: BS and MS

Role: class teacher

Teaching Form: classroom teaching,
lectures, grading

Number of times: 1 time at Charles
University in Prague (2015)

Multi-Level Graph Representation

Language: English

ECTS points: 3

Number of students: 15-20

Educational Level: MS and PhD

Role: class teacher

Teaching Form: lectures, presentations,
project supervision

Number of times: 1 time at Arizona
(2018)

Courses 9-12

Automata, Grammars and Languages

Language: English

ECTS points: 3

Number of students: 80-120

Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
lectures, TA supervision

Number of times: 5 times at Arizona
(2020, 2019, 2013, 2002, 2001)

Courses 9-12

Automata, Grammars and Languages

Language: English

ECTS points: 3

Number of students: 80-120

Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
lectures, TA supervision

Number of times: 5 times at Arizona
(2020, 2019, 2013, 2002, 2001)

Analysis of Discrete Structures

Language: English

ECTS points: 3

Number of students: 80-120

Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
lectures, TA supervision

Number of times: 3 times at Arizona
(2015, 2009, 2005)

Courses 9-12

Automata, Grammars and Languages

Language: English

ECTS points: 3

Number of students: 80-120

Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
lectures, TA supervision

Number of times: 5 times at Arizona
(2020, 2019, 2013, 2002, 2001)

To Planarity and Beyond: Algorithms for (Not-So-)Planar Graphs

Language: English

ECTS points: 3

Number of students: 15-20

Educational Level: MS and PhD

Role: class teacher

Teaching Form: lectures, presenta-
tions, project supervision

Number of times: Arizona (2018)

Analysis of Discrete Structures

Language: English

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Number of students: 80-120

Educational Level: BS

Role: class teacher

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lectures, TA supervision

Number of times: 3 times at Arizona
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Courses 9-12

Automata, Grammars and Languages

Language: English

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Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
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Teaching Form: lectures, presenta-
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Analysis of Discrete Structures

Language: English

ECTS points: 3

Number of students: 80-120

Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
lectures, TA supervision

Number of times: 3 times at Arizona
(2015, 2009, 2005)

Graph Theoretic Concepts in CS

Language: English

ECTS points: 3

Number of students: 15-20

Educational Level: MS and PhD

Role: class teacher

Teaching Form: lectures, presenta-
tions, project supervision

Number of times: 1 time at Arizona
(2007)

Courses 13-16

Operating Systems

Language: English

ECTS points: 3

Number of students: 60-80

Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
lectures, TA supervision

Number of times: 1 time at Dart-
mouth College (1999)

Courses 13-16

Operating Systems

Language: English

ECTS points: 3

Number of students: 60-80

Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
lectures, TA supervision

Number of times: 1 time at Dart-
mouth College (1999)

Research Methods in CS

Language: English

ECTS points: 3

Number of students: 60-80

Educational Level: BS and MS

Role: class teacher

Teaching Form: classroom teaching,
lectures, project supervision, grading

Number of times: 1 time at the Uni-
versity of Botswana (2007)

Courses 13-16

Operating Systems

Language: English
ECTS points: 3
Number of students: 60-80
Educational Level: BS
Role: class teacher
Teaching Form: classroom teaching,
lectures, TA supervision
Number of times: 1 time at Dart-
mouth College (1999)

Concepts in Computing

Language: English
ECTS points: 3
Number of students: 80-120
Educational Level: BS
Role: class teacher
Teaching Form: classroom teaching,
lectures, TA supervision
Number of times: 1 time at Dart-
mouth College (1999)

Research Methods in CS

Language: English
ECTS points: 3
Number of students: 60-80
Educational Level: BS and MS
Role: class teacher
Teaching Form: classroom teaching,
lectures, project supervision, grading
Number of times: 1 time at the Uni-
versity of Botswana (2007)

Courses 13-16

Operating Systems

Language: English

ECTS points: 3

Number of students: 60-80

Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
lectures, TA supervision

Number of times: 1 time at Dart-
mouth College (1999)

Concepts in Computing

Language: English

ECTS points: 3

Number of students: 80-120

Educational Level: BS

Role: class teacher

Teaching Form: classroom teaching,
lectures, TA supervision

Number of times: 1 time at Dart-
mouth College (1999)

Research Methods in CS

Language: English

ECTS points: 3

Number of students: 60-80

Educational Level: BS and MS

Role: class teacher

Teaching Form: classroom teaching,
lectures, project supervision, grading

Number of times: 1 time at the Uni-
versity of Botswana (2007)

Data Structures in C++

Language: English

ECTS points: 3

Number of students: 80-120

Educational Level: BS

Role: class teacher (co-instructor)

Teaching Form: classroom teaching,
lectures, TA supervision

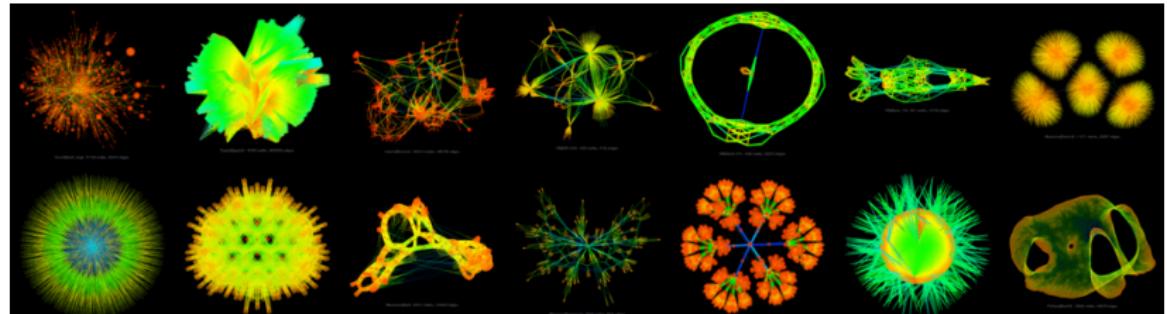
Number of times: 1 time at Johns
Hopkins University (1999)

Questions?

Donald Knuth (Keynote Presentation at GD'95)

Graph drawing is the best possible field I can think of. It merges aesthetics, mathematical beauty and wonderful algorithms. It therefore provides a harmonic balance between the left and right brain parts.

- Questions for me?
- Questions from me?



Robbins Introduces UA Science Series

The UA president's focus on the 21st-century convergence of the physical, digital and biological worlds will be addressed by "Humans, Data and Machines," which launched with a lecture by UA computer scientist Stephen Kobourov.

By Doug Carroll, University Communications

Jan. 22, 2018



LECTURES

Problem Solving With Algorithms

STEPHEN KOBOUROV — JANUARY 22, 2018

The idea of computation and algorithms is old, but modern day computers are a relatively new phenomenon. Even more recent are the notions of artificial intelligence (AI), machine learning (ML) and big data. Progress in these fields has a significant impact on our lives and raises important mathematical and engineering challenges but also philosophical and ethical considerations.

CATEGORIES [MATH AND COMPUTER SCIENCE](#)



UA President Robert C. Robbins addresses the Centennial Hall audience before the start of Monday night's science lecture.

'Catalysts of Change' is Theme of Arizona Science Lecture Series

University of Arizona experts will focus on climate, space, artificial intelligence and genetic engineering – four topics that continue to change the world and influence the way people will live in the future.

University Communications

Jan. 27, 2020

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LECTURE

15.3



LECTURES

The Promise and Peril of Artificial Intelligence

STEPHEN KOBOUROV, CARLOS SCHEIDECKER — FEBRUARY 25, 2020

The word robot is 100 years old, but only recently has AI begun to make real-life impact, from Apple's Siri to Uber's self-driving cars. Rapid advances in machine learning have renewed the idea of modeling how the human brain works by building deep neural networks that learn how to solve problems with the help of many examples. Like other revolutions, AI comes with great promise: better medical diagnoses, more efficient transportation, and personalized recommendations from shopping to music to fitness routines. There's also peril, since AI enables mass surveillance and manipulation, and perpetuates societal biases. There are

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Lectures



Many of Arizona's finest minds help ASA members keep abreast of local, state, national and international events. With topics ranging from immigration reform to health care, from global warming to spicy cooking, from political cartooning to famous murals in South Tucson, twice-weekly lectures bring cutting-edge issues and leading-edge research right to our door.

To see the current list and descriptions of upcoming lectures [click here](#):

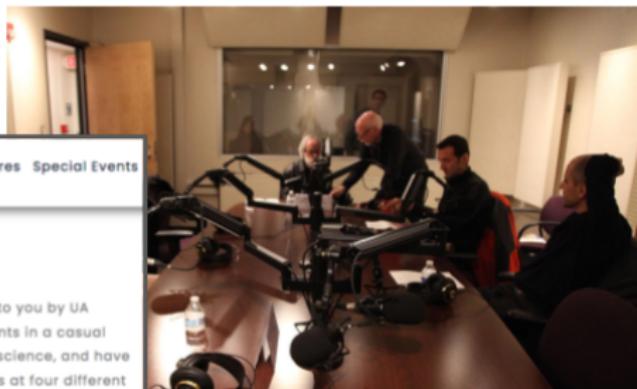
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UA Science Café

The University of Arizona

Discover the fascinating science happening all around us at the UA Science Café Series, brought to you by UA Science. Science Cafés bring the community together with a U of A scientists and graduate students in a casual setting. You'll learn about the latest research being conducted, get to know the faces behind the science, and have opportunities to ask questions and deepen your understanding. We have four separate café series at four different



Selected External Service

Steering Committees and Editorial Boards

- Steering Committee Chair, Intl. Symposium on Graph Drawing and Network Visualization (GD)
- Editorial Board, IEEE Transactions on Visualization and Computer Graphics (TVCG)
- Editorial Board, Journal of Computational Geometry, Theory and Applications (CGTA)
- Editorial Board, Journal of Graph Algorithms and Applications (JGAA)

Program Committee Chair

- Dagstuhl Seminar 23051, "Perception in Network Visualization", 2023
- Dagstuhl Seminar 21152, "Multi-Level Graph Representation...", 2021
- 21st ACM-SIAM Conference on Algorithm Engineering and Experiments (ALENEX), 2019
- Dagstuhl Seminar 16452, "Beyond-Planar Graphs: Algorithms and Combinatorics", 2016
- Dagstuhl Seminar 13151, "Drawing Graphs and Maps with Curves", 2013
- Dagstuhl Seminar 12261, "Putting Data on the Map", 2012
- 5th IEEE Pacific Visualization Symposium (PacificVis), 2011
- Dagstuhl Seminar 11191, "Graph Drawing with Algorithm Engineering Methods", 2011
- Dagstuhl Seminar 08191, "Graph Drawing for Bioinformatics and Social Sciences", 2008
- 13th Annual Graph Drawing Contest Committee, 2006
- Dagstuhl Seminar 05191, "Graph Drawing", 2005
- 12th Annual Graph Drawing Contest Committee, 2005
- 11th Annual Graph Drawing Contest Committee, 2004
- 10th International Symposium on Graph Drawing (GD), 2002

Selected External Service

Program Committee Member (last 10 years)

- IEEE VIS: Visualization and Visual Analytics (VIS), Oklahoma City, OK, 2022
- 15th IEEE Pacific Visualization Symposium (PacificVis), Tsukuba, Japan, 2022
- 30th International Symposium on Graph Drawing (GD), Tokyo, Japan, 2022
- 16th Intl. Conference & Workshops on Algorithms and Computation (WALCOM), Indonesia, 2022
- IEEE VIS: Visualization and Visual Analytics (VIS), New Orleans, LA, 2021
- 1st SIAM Applied Computational & Discrete Algorithms (ACDA), Spokane, 2021
- 13th IEEE Pacific Visualization Symposium (PacificVis), Tianjin, China, 2020
- 35th Symposium on Computational Geometry (SoCG), Portland, 2019
- 12th IEEE Pacific Visualization Symposium (PacificVis), Bangkok, Thailand, 2019
- 11th ACM Symposium on Eye Tracking Research & Applications (ETRA), 2019
- 21st IEEE Eurographics Conference on Visualization (EUROVIS), Lisbon, Portugal, 2019
- 2nd Workshop on Big Data Visual Exploration and Analytics (BigVis), Lisbon, Portugal, 2019
- 23rd IEEE Information Visualization Symposium (INFOVIS), Berlin, Germany, 2018
- 20th IEEE Eurographics Conference on Visualization (EUROVIS), Brno, Czech Republic, 2018
- IEEE Conference on Software Visualization (VISSOFT), Madrid, Spain, 2018
- 26nd International Symposium on Graph Drawing (GD), Barcelona, Spain, 2018
- 11th IEEE Pacific Visualization Symposium (PacificVis), Kobe, Japan, 2018
- IEEE Visual Analytics Science and Technology Conference (VAST), Phoenix AZ, 2017
- 19th IEEE Eurographics Conference on Visualization (EUROVIS), Barcelona, Spain, 2017
- 10th IEEE Pacific Visualization Symposium (PacificVis), Seoul, Korea, 2017
- 21th IEEE Information Visualization Symposium (INFOVIS), Baltimore, 2016
- 18th IEEE Eurographics Conference on Visualization (EUROVIS), Groningen, Netherlands, 2016
- 10th IEEE Pacific Visualization Symposium (PacificVis), Taipei, Taiwan, 2016
- IEEE Conference on Software Visualization (VISSOFT), Raleigh, North Carolina, 2016
- 24nd International Symposium on Graph Drawing (GD), Athens, 2016
- 7th Intl. Conf. on Information, Intelligence, Systems and Applications (IISA), Greece, 2016
- 21th IEEE Information Visualization Symposium (INFOVIS), Chicago, IL, 2015
- 17th IEEE Eurographics Conference on Visualization (EUROVIS), Cagliari, Italy, 2015
- 8th IEEE Pacific Visualization Symposium (PacificVis), Hangzhou, China, 2015
- 20th IEEE Information Visualization Symposium (INFOVIS), Paris, France, 2014
- 16th IEEE Eurographics Conference on Visualization (EuroVis), Swansea, UK, 2014
- IEEE Conference on Software Visualization (VISSOFT), Victoria, BC, Canada, 2014
- 22nd International Symposium on Graph Drawing (GD), Würzburg, Germany, 2014
- 7th IEEE Pacific Visualization Symposium (PacificVis), Yokohama, Japan, 2014
- IEEE Conference on Software Visualization (VISSOFT), Eindhoven, Netherlands, 2013
- 23st Fall Workshop on Computational Geometry (FWCG), New York NY, 2013

Selected Internal Service

University and College Level

- Advisory Board, College of Science Lecture Series, University of Arizona
- Advisory Board, W.A. Franke Honors College, University of Arizona
- Research Director, Data Science Institute, University of Arizona

Department of Computer Science

- Chair of Annual Evaluations Committee
- Chair of Promotion and Tenure Committee
- Chair of Graduate Admissions Committee
- Chair of Colloquium and Seminar Series
- Member of the Diversity, Equity and Inclusion Committee
- Member of Graduate Curriculum Committee
- Member of Undergraduate Curriculum Committee
- Member of Strategic Planning Committee

Papers Covered in Media

D. Fried, M. Surdeanu, S. Kobourov, M. Hingle, D. Bell "Analyzing the language of food on social media," *IEEE International Conference on Big Data*, p. 778-783, 2014 (90 citations)

- **People**
<http://greatideas.people.com/2014/09/22/state-food-study-twitter-hashtags/>
 - **Business Insider**
<http://www.businessinsider.com/popular-food-on-twitter-in-every-state-2014-9>
 - **Washington Post**
<http://www.washingtonpost.com/blogs/local/wp/2014/09/29/our-favorite-foods-to-tweet-about-state-by-state/>
 - **New York Post**
<http://nypost.com/2014/09/18/study-proves-new-yorkers-are-obsessed-with-brunch/>
 - **Boston Globe**
<http://www.boston.com/news/local/massachusetts/2014/09/20/massachusetts-favorite-food-cod-really/MUJGoHhVz7rAMdMjstziHL/story.html>
 - **Guardian**
<http://www.theguardian.com/lifeandstyle/2014/sep/22/americans-eat-tweet-state-analysis-food-twitter>
 - **Daily Mail**
<http://www.dailymail.co.uk/news/article-2761139/Grits-prunes-win-Survey-breaks-popular-foods-state-yields-two-unlikely-winners.html>



Why Leave? University of Copenhagen and Beyond

Big and diverse department, with many research groups beyond the obvious two

- Human Centered Computing Group: Daniel Ashbrook, Joanna Bergström, Pernille Bjørn, Kasper Hornbæk, Jakob Grue Simonsen, Daniel Spikol
- Algorithms and Complexity Group: Mikkel Abrahamsen, Stephen Alstrup, Jacob Holm, Jakob Nordström, Rasmus Pagh, Mikkel Thorup, Christian Wulff-Nilsen

Great opportunities for collaboration with other departments/faculties

- Mathematics and Statistics (Data Science Lab, Geometry Center)
- Bioinformatics and Medicine (BRIC, Biomedical Sciences)
- Physics and Geosciences (Niels Bohr Institute, Geoinfromatics)

Collaborations with other Universities

- DTU: Visual Computing (Jakob Bardram), Graph Theory (Carsten Thomassen)
- ITU: HCI (Louise Barkhuus), Digital Humanities (Michele Coscia)

Why Leave? My University is going in the wrong direction

HIGHER EDUCATION

U. of Arizona Bought a For-Profit U.

EDUCATION

UA's \$14-million gamble: Consultant gave pricey advice to devise strategic plan

Carol Ann Alaimo and Justin Sayers Arizona Daily Star

Published 5:51 p.m. MT Nov. 9, 2019

<https://openpayrolls.com> › rank › university-of-arizona

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University of Arizona (UA) Highest Paid Employees

#Rank	Name	Job Title	Pay
1	Sean Miller	Head Men's Basketball Coach	\$2,400,000
2	Peter Nakaji	Chair, Neurosurgery - Bumcp	\$1,550,000
3	Kevin Sumlin	Head Football Coach	\$1,100,000

Saturday Night Live mocks 'UArizona' name change



Why Leave? Arizona is heading in the wrong direction

The New York Times

U.S.

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH

POLITICS EDUCATION BAY AREA CHICAGO TEXAS

The Arizona Shooting, and What Led Up to It

Twenty people were shot and six died Saturday in the attempted assassination

[Roe v. Wade Overturned](#) | Tracking Abortion Bans Your Questions, Answered

Supreme Court Lets Decision on Arizona Abortion Law Stand

Arizona cities respond to the worst drought in over a thousand years with a new plan

July 18, 2022 · 4:50 PM ET

The Arizona GOP asks supporters if they're willing to die to overturn Trump's election loss

Olivia Sestak and Jake LaPutt Dec 8, 2020, 12:34 PM

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Why Leave? The USA is heading in the wrong direction

The Washington Post
Democracy Dies in Darkness

There have been over 300 mass shootings so far in 2022

By Julia Ledur, Kate Rabinowitz and Artur Galocha
Updated July 5, 2022 at 11:48 a.m. EDT Published June 2, 2022 at 1:49 p.m. EDT

A quarter of Americans open to taking up arms against government, poll says

Survey of 1,000 registered US voters also reveals that most Americans agree government is 'corrupt and rigged'

The Washington Post
Democracy Dies in Darkness

Trump sought to lead armed mob to Capitol on Jan. 6, aide says

