Philosophy

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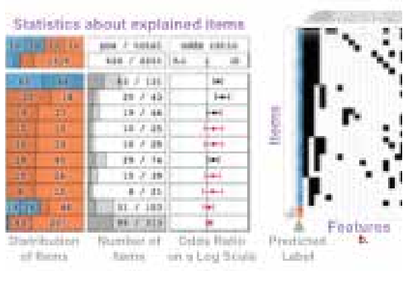
Research Highlights

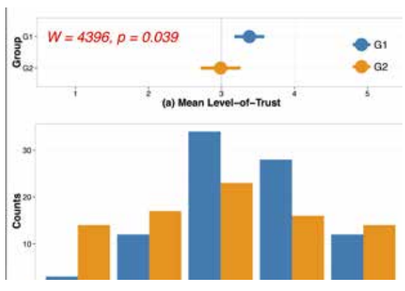
Visualization tool for interacting with model explanations



J. Krause, A. Dasgupta, J. Swartz, Y. Aphinyanaphongs, and E. Bertini.
"A Workflow for Visual Diagnostics of Binary Classifiers using Instance-Level Explanations."

IEEE VAST, 2017.

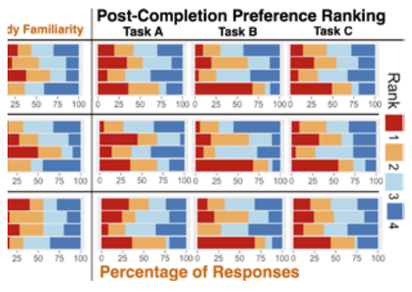
Effects of transparency in analytical systems



A. Dasgupta, J. Lee, R. Wilson, R. Lafrance, N. Cramer, K. Cook, and S. Payne.
"Familiarity Vs Trust: A Comparative Study of Domain Scientists' Trust in Visual Analytics and Conventional Analysis Methods.Explanations."

IEEE TVCG, 2017.

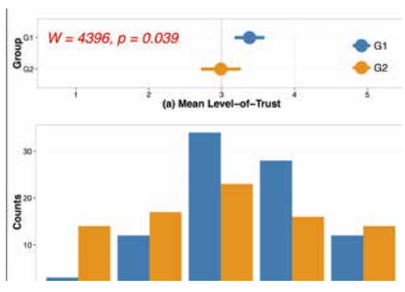
Evaluating experts' visualization task accuracy and preferences



A. Dasgupta, S. Burrows, K. Han, and P. J. Rasch.
"Empirical Analysis of the Subjective Impressions and Objective Measures of Domain Scientists' Visual Analytic Judgments."

ACM CHI, 2017.

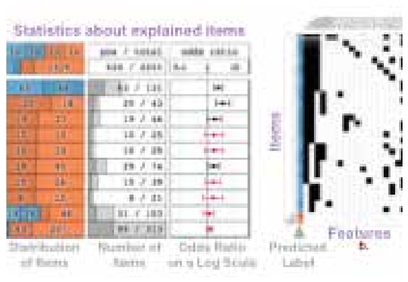
Design space of visualizations for change perception



A. Dasgupta, D. Arendt, L. Franklin, P. C. Wong, and K. Cook.
"Human Factors in Streaming Data Analysis: Challenges and Opportunities for Information visualization."

CGF, 2018.

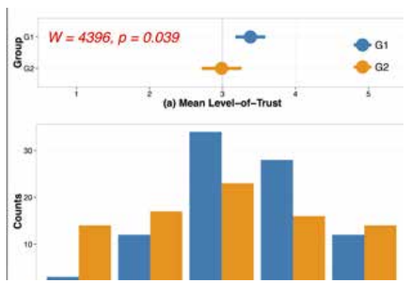
Research Areas



Interactive Visual Comparison

Let domain scientists reason about computational model behavior and help them select the most accurate models by interactively comparing multiple facets of model performance.

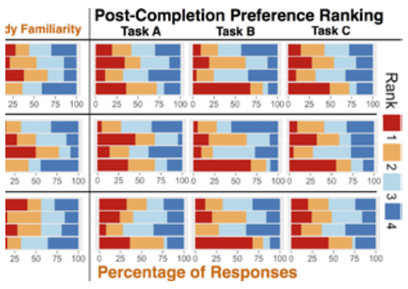
EuroVis14 | TVCG14 | CISE15 | InfoVis19



Studies on Visualization Effectivenesstems

Conduct user studies with experts from biology and climate science domains to evaluate if and how optimal visualization design can overcome potential biases due to familiarity.

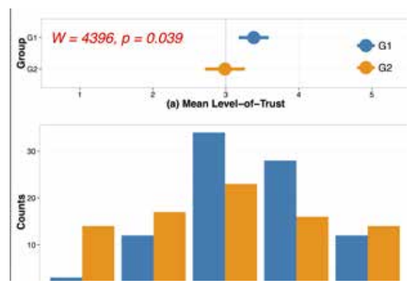
TVCG16 | CHI17 | Chapter 6,Cognitive Biases Book 18 | TVCG19



Model Explainability and Trust

Provide domain experts and model developers with tools that explain the decisions of machine learning models and help them semantically validate models.

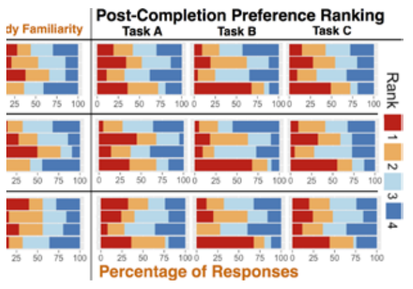
HILDA17 | TVCG17 | VAST17 | UIST18



Visualization Perception & Design Analysis

Study and survey of the visualization design space for devising classification schemes that bridge human perception with visual encodings.

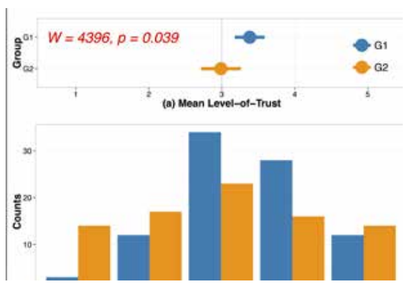
TVCG15 | CGF17 | CGF18 | VisComm18



High-Dimensional Pattern Search

Provide guidance to analysts for finding patterns in high-dimensional subspaces by devising metrics that quantify salient patterns.

InfoVis10 | LDAV12 | CGF2015 | LDAV2016



Privacy-Preserving Data Visualization

Adapt visualizations to prevent disclosure of sensitive information by developing information loss metrics that can help address the trade-off between privacy gain and loss of utility due to anonymization.

InfoVis11 | CGF12 | CGF13 | EHRVis14 | VizSec19

The Team

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Publications

2020

Privacy-Preserving Data Visualization: Reflections on the State of the Art and Research Opportunities
K Bhattacharjee, M Chen, A Dasgupta
Computer Graphics Forum

The Effect of Color Scales on Climate Scientists' Objective and Subjective Performance in Spatial Data Analysis Tasks
A Dasgupta, J Poco, B Rogowitz, K Han, E Bertini, CT Silva
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Separating the Wheat from the Chaff : Comparative Visual Cues for Transparent Diagnostics of Competing Models
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A Dasgupta, M Chen, R Kosara
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SM Burrows, A Dasgupta, S Reehl, L Bramer, PL Ma, PJ Rasch, Y Qian
Advances in Atmospheric Sciences 35 (9), 1101-1113

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Experts' Familiarity Versus Optimality of Visualization Design: How Familiarity Affects Perceived and Objective Task Performance
A Dasgupta
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C Felix, A Dasgupta, E Bertini
ACM User Interface Software and Technology Symposium (UIST)

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A Dasgupta, S Burrows, K Han, PJ Rasch
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A Dasgupta, JY Lee, R Wilson, R Lafrance, N Cramer, K Cook, SH Payne
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J Krause, A Dasgupta, JD Fekete, E Bertini
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Jorge Poco, Aritra Dasgupta, Yaxing Wei, William Hargrove, Christopher R Schwalm, Deborah N Huntzinger, Robert Cook, Enrico Bertini, Claudio T Silva
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arXiv preprint arXiv:1302.5824

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A Dasgupta, R Kosara
University of North Carolina at Charlotte

2011

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