ANALYSIS, VISUALIZATION & INTERACTION

Aviz

www.aviz.fr

informatiques mathématiques Inria

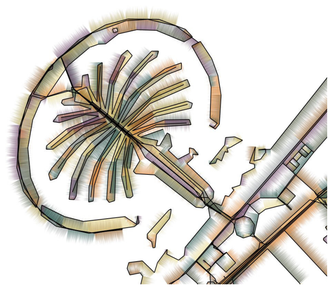
NEW VISUAL REPRESENTATIONS

NEW INTERACTIONS

NPR & Illustrative Visualization

Rendering techniques and visual representations inspired by traditional artistic and illustrative depiction.

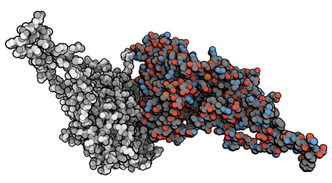
2013 • Visual Abstraction and Stylization of Maps



Based on open-source data, geographic maps are abstracted interactively to allow a person to explore a variety of different abstraction æsthetics.

Credits: **Tobias Isenberg.**

2011 • Continuous Abstraction in Illustrative Visualization



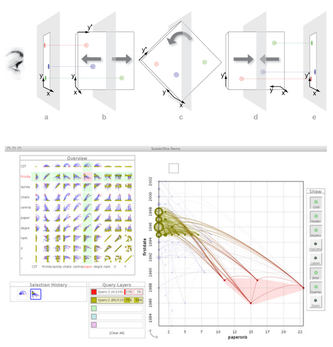
Different illustrative rendering types are combined to create a three-dimensional abstraction space.

Credits: **Matthew van der Zwan, Wouter Lueks, Henk Bekker, Tobias Isenberg.**

Multi-Dimensional Data

Improving the visual representation and navigation of multi-dimensional data.

2009 • ScatterDice



ScatterDice is a new interactive method to explore multidimensional data using scatterplots. This exploration is performed using a scatterplot matrix that presents an overview of the possible configurations, thumbnails of the scatterplots, and support for interactive navigation in the multi-dimensional space. Transitions between scatterplots are performed as animated rotations in 3D space.

Credits: **Niklas Elmqvist, Pierre Dragicevic, Jean-Daniel Fekete.**

Wall-Sized

Supporting large-scale data analysis and interaction with visualization on a high-resolution wall.

2012 • Perception of data across the wall

Understand the implications of the wall setup for the perception of visualization building blocks across large viewing distances and extreme viewing angles.

Credits: **Anastasia Bezerianos, Petra Isenberg.**

2012 • TRC

Two users dynamically filtering data displayed on a wall-size display using tangible remote controllers. Tangible remote controllers are built using off-the-shelf touch tablets and capacitive controllers that stick to the tablets and can be freely rearranged.

Credits: **Yvonne Jansen, Pierre Dragicevic, Jean-Daniel Fekete.**

Tangible

Moving data and controls to the physical world to exploit people's abilities to manipulate objects and collaborate.

2012 • Stackables

Stackables support faceted information seeking. They were designed for meetings, for sharing results from individual search activities, and for realistic datasets with multiple facets and large value ranges.

Credits: **Stefanie Klum, Petra Isenberg, Ricardo Langner, Jean-Daniel Fekete, Raimund Dachselt.**

2012 • Physical Visualizations

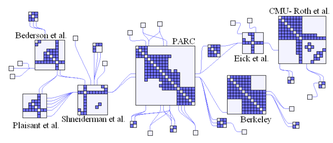
Physical 3D bar charts of country indicators evolving over time, made of lasercut acrylic. These were built for an experiment comparing physical visualizations with on-screen visualizations.

Credits: **Yvonne Jansen, Pierre Dragicevic, Jean-Daniel Fekete.**

Networks

New and hybrid visual representations and interactions for exploring networks.

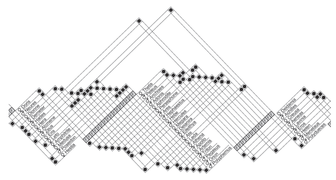
2007 • NodeTrix



Coauthorship network viewed using NodeTrix. Every matrix represents a group of researchers who closely collaborate. Links show occasional collaborations between researchers from different groups.

Credits: **Nathalie Henry, Jean-Daniel Fekete, Michæl Mcguffin.**

2010 • GeneaQuilts



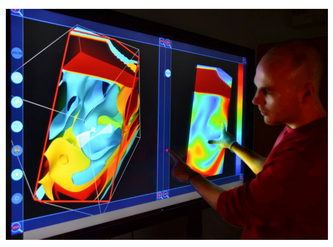
Detail of the genealogy of Greek gods shown using GeneaQuilts. Each F icon represents a nuclear family composed of parents (black dots above the F icon) and children (black dots below).

Credits: **Anastasia Bezerianos, Pierre Dragicevic, Jean-Daniel Fekete, Juhee Bæ, Ben Watson.**

Touch Interaction

Creation of integrated touch interaction toolkit for 3D data exploration.

2012 • Direct-Touch Interaction with 3D Visualizations

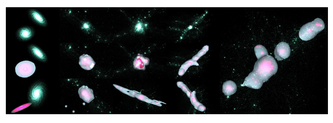


A challenge is the need to combine many different techniques into a single interaction toolkit. This works explores such a combination for 3D fluid dynamics data.

Credits: **Tijmen Klein, Florimond Guéniat, Luc Pastur, Frédéric Vernier, Tobias Isenberg.**

(2D) touch interaction with 3D visualization spaces.

2012 • Efficient Structure-Aware Selection Techniques for 3D Point Cloud Visualizations



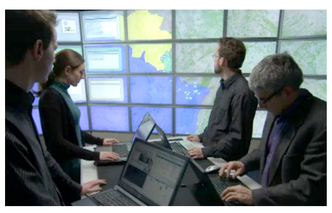
This touch interaction technique allows people to intuitively select subsets of 3D point clouds even though they only draw a lasso on a two-dimensional point cloud.

Credits: **Lingyun Yu, Konstantinos Efstathiou, Petra Isenberg, Tobias Isenberg.**

Visual Analytics

Combining visualization, data analysis and data management to make sense of very large dynamic data sources.

2010 • VisMaster



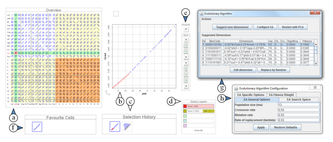
This video, realized by AVIZ for the VisMaster European Project, explains what Visual Analytics is in a pedagogical manner.

Credits: **Fanny Chevalier, Jean-Daniel Fekete, Christian Blonz.**

Interactive Evolution

Combining Evolutionary Optimisation, interaction and Visualisation, to deal with complex exploration problems.

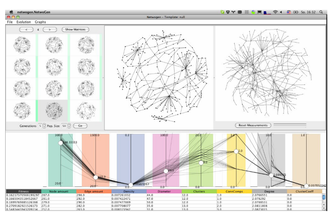
2012 • EvoGraphDice



EvoGraphDice interactively evolves compound additional dimensions, that provide new viewpoints on a multidimensional dataset. The user can explicitely guide the search process, or let the system freely suggest new viewpoint.

Credits: **Waldo Gonzalo Cancino Ticona, Anastasia Bezerianos, Nadia Boukhelifa, Evelyne Lutton.**

2012 • GraphCuisine



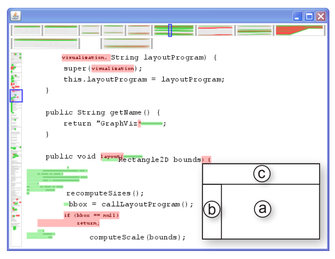
GraphCuisine lets users create random graphs matching a set of user-specified measures. It is based on interactive evolutionary algorithm allowing users to steer the algorithm using their visual judgment

Credits: **Benjamin Bach, André Spritzer, Évelyne Lutton, Jean-Daniel Fekete.**

Animations

Studying how smooth animated transitions can help users navigate between data views without getting lost.

2010 • Animating text edit histories



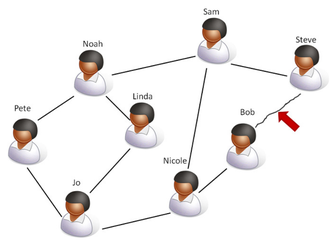
A screenshot of the Diffamation system for rapidly exploring changes in text content like Java code or Wikipedia articles. When the user switches revision in the history (c), edits are smoothly animated both in the text viewport (a) and in the document overview (b).

Credits: **Fanny Chevalier, Pierre Dragicevic, Anastasia Bezerianos, Jean-Daniel Fekete.**

Visualizing Uncertainty

Investigating methods to depict uncertainty in data such as sketchy rendering.

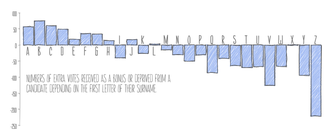
2012 • Sketchiness for Depicting Qualitative Uncertainty



Sketchiness, inspired by features of hand-drawn strokes, was applied to the rendering of edges in a social network. The more sketchy the line, the more uncertain is the connection between the nodes.

Credits: **Nadia Boukhelifa, Anastasia Bezerianos, Tobias Isenberg, Jean-Daniel Fekete.**

2012 • Sketchy Rendering for Information Visualization



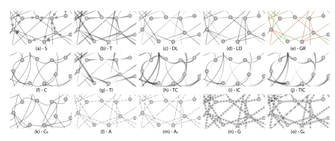
Using simulated sketchiness, visualizations can be rendered as if they would have been drawn by hand. The sketchiness can encode data or can be used to influence people's attitude toward visualizations.

Credits: **Jo Wood, Petra Isenberg, Tobias Isenberg, Jason Dykes, Nadia Boukhelifa, Aidan Slingsby.**

Perception & Cognition

Studying how to best use our senses and cognitive capabilities to perceive visual representations and interact with them.

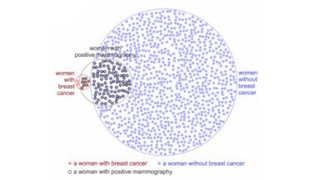
2010 • Perception of directed edges



Study multiple design variations of directed edges to find out which design is most effective for which type of graph visualizations.

Credits: **Danny Holten, Petra Isenberg, Jarke van Wijk, Jean-Daniel Fekete.**

2012 • Visualizations for probabilistic judgement



One of the 7 visualizations used in our study to assess whether visualizations can help reduce Bayesian reasoning fallacies. This visualization of the classic mammography problem combines an Euler diagram with glyphs.

Credits: **Luana Micallef, Pierre Dragicevic, Jean-Daniel Fekete.**

Collaboration

Support the activities of small teams when analyzing data using visualizations.

2009 • CoCoNutTrix

Support teams of up to four analysts in analyzing social networks in a synchronous co-located setting.

Credits: **Petra Isenberg, Anastasia Bezerianos, Nathalie Henry, Sheelagh Carpendale, Jean-Daniel Fekete.**

SOFTWARE INFRASTRUCTURES

EVALUATION METHODS

Poster design: **Jeremy Boy • 2012**

Aviz Team Members

Jean-Daniel Fekete
jean-daniel.fekete@inria.fr

Evelyne Lutton
evelyne.lutton@inria.fr

Tobias Isenberg
tobias.isenberg@inria.fr

Petra Isenberg
petra.isenberg@inria.fr

Pierre Dragicevic
pierre.dragicevic@inria.fr

Benjamin Bach
Nadia Boukhelifa
Jeremy Boy
Waldo Cancino
Samuel Huron
Yvonne Jansen
Alexandra Merlin
Charles Perin
Andre Spritzer
Romain Vuillemot

Funding Partners

digiteo Research in science and technology of information

cap-digital Paris Region

Microsoft Research

SEVENTH FRAMEWORK PROGRAMME

UNIVERSITÉ PARIS SUD

SYSTEMATIC PARIS REGION SYSTEMS & ICT CLUSTER

Google

ANR