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# Program

Day 1 March 1, 2011 Tuesday	Day 2 March 2, 2011 Wednesday
<b>Registration</b> 08:30	<b>Registration</b> 08:00
	<b>Opening Session</b> 08:45-09:00
<b>Tutorial I</b> Parallel Coordinates 09:00 - 12:00	<b>Keynote Speech I</b> Arie Kaufman 09:00 - 10:00
	<b>Coffee Break</b> 10:00 - 10:20
	<b>Session 1</b> Volume Rendering and Navigation 10:20 - 12:00
<b>Lunch</b> 12:00 - 13:30	<b>Lunch</b> 12:00 - 13:30
<b>Tutorial II</b> Visualization for Large Multi-touch Interactive Surfaces 13:30 - 17:00	<b>Session 2</b> Visualization in Medicine and Natural Sciences 13:30 - 15:10
	<b>Coffee Break</b> 15:10-15:30
	<b>Session 3</b> Vector Fields and Flow Visualization 15:30 - 17:35
*Coffee Breaks at 10:00 & 15:10 on Day 1	<b>Poster Fast Forward</b> 17:40 - 18:00
	<b>Poster Session</b> 18:00 - 20:00

Day 3 March 3, 2011 Thursday	Day 4 March 4, 2011 Friday
<b>Registration</b> 08:30	<b>Registration</b> 08:30
<b>Keynote Speech II</b> Kwan-Liu Ma 09:00 - 10:00	<b>Keynote Speech III</b> Ulrik Brandes 09:00 - 10:00
<b>Coffee Break</b> 10:00 - 10:20	<b>Coffee Break</b> 10:00 - 10:20
<b>Session 4</b> Collaboration and Text 10:20 - 12:00	<b>Session 6</b> Graph Visualization 10:20 - 12:00
<b>Lunch</b> 12:00 - 13:30	<b>Closing Session and Best Paper Award</b> 12:00 - 12:30
<b>Panel</b> Visualization Research in Asia Pacific 13:30 - 15:00	
<b>Poster Session and Coffee Break</b> 15:00 - 15:50	
<b>Session 5</b> Space and Time 15:50 - 17:55	
<b>Banquet</b> 18:00 - 21:00	

## Tutorial I

Day 1 09:00-12:00

### Parallel Coordinates

Xiaoru Yuan      Peking University

Huamin Qu      Hong Kong University of Science and Technology

Among many techniques proposed for exploratory visualization of multidimensional data, parallel coordinates scheme, which represents an  $N$  dimensional data tuple as one polyline crossing parallel axes, has been widely applied. In this tutorial, we will cover multiple aspects related to research on parallel coordinates. Basic concepts and major research issues in parallel coordinates will be first addressed. Further, we will discuss a wide spectrum of parallel coordinates applications, covering a varieties of data types. This tutorial is suitable for both researchers who are interested in research on parallel coordinates and domain users who are interested in taking parallel coordinates as a tool.

#### Bio:

Xiaoru Yuan is a faculty member in the School of Electronics Engineering and Computer Science at Peking University. His primary research interests fall in the field of visualization with emphasis on information visualization, high performance visualization and novel visualization user interface. His co-authored work on high dynamic range volume visualization received Best Paper Award at the IEEE Visualization 2005 conference. He received Bachelor degrees in chemistry and law from Peking University, China, in 1997 and 1998, respectively. He received the Ph.D. degree in computer science in 2006, from the University of Minnesota at Twin Cities. For more information see his research group website at <http://vis.pku.edu.cn/>.

Huamin Qu is currently an associate professor in the Department of Computer Science and Engineering at the Hong Kong University of Science and Technology. He received a BS in Mathematics from Xi'an Jiaotong University, China, an MS and a PhD (2004) in Computer Science from the State University of New York at Stony Brook. His main research interests are in visualization and computer graphics. He is a winner of 2009 IBM Faculty Award and receives Honorable Mention for Best Paper Award at IEEE Visualization 2009. He serves as a guest editor for ACM Transactions on Intelligent Systems and Technology, and IEEE Computer Graphics and Application. He is also a program co-chair of IEEE Pacific Visualization Symposium 2011.

## Tutorial II

Day 1 13:30-17:00

### Visualization for Large Multi-touch Interactive Surfaces

Petra Isenberg , INRIA

Large touch-sensitive surfaces such as tabletop or wall displays lend themselves to making sense of large data sets and collaborative analysis. Touch-sensitive surfaces are often associated with being 'intuitive' and 'natural' and may provide additional benefits, for example, in form of added awareness of collaborators' actions, better performance than mouse interaction in certain cases, and multiple degrees of freedom input. As interactive displays become part of our everyday environments, they provide new data analysis platforms that can encourage alternative forms of data exploration and promote the use of visualization techniques even by non-experts. In this tutorial, you will learn about current touch-sensitive display technology and the possibilities to use those surfaces for data analysis and visualization. In addition, you will learn about the challenges of developing visualizations and interaction techniques for individual and synchronous group interaction. Finally, the tutorial will provide an overview of recent research solutions for touch-interactive visualization on large displays.

Bio:

Petra Isenberg is a research scientist at INRIA, the French National Research Institute for Computer Science and Control. She has been actively involved in research on visualization applications for tabletop displays and large wall displays, with a focus on synchronous team work. Her main research interests include information visualization, visual analytics, and computer supported cooperative work. Petra holds a PhD from the University of Calgary in Canada and a Diplom degree (equiv. to a Master's) from the University of Magdeburg in Germany. For more information see her website at <http://www.aviz.fr/~isenberg/>.

## Keynote Speech I

Day 2 9:00-10:00

### **Immersive Exploration of Large Datasets**

Arie Kaufman, Stony Brook University

Scientists, engineers and physicians are now confronted with a fire hose of data. Immersive visualization environments provide these users with a novel way of interacting and reasoning with large datasets. They allow them to utilize the entirety of their visual bandwidth, effectively engulfing the user in the data and enabling collaborative interaction. We present a custom-built 5-wall Cave environment, called the Immersive Cabin (IC). It is driven by a GPU cluster for both computation and 3D stereo rendering. We also propose a conformal deformation rendering pipeline for the visualization of datasets on partially-immersive platforms. Combined with a range of interaction and navigation tools, our system can support numerous interactive applications of large datasets. Several demonstrations include architectural visualization, urban planning, medical visualization, simulation and rendering of physical phenomena, and entertainment.

Current visualization displays, however, have not kept up with the explosive growth in data size and resolution, which is beginning to match the resolution of the visuals that surround us in daily life. To ameliorate this challenge, we have developed a life-like, realistic immersion into the petascale data to be explored, appropriately called The RealityDeck. It is a one-of-a kind pioneering G-pixel immersive and collaborative display system - a unique assembly of high-res display panels, GPU cluster, sensors, networking, computer vision, and human-computer interaction technologies.

Bio:

Arie Kaufman is a Distinguished Professor and Chairman of the Computer Science Department, Director of the Center of Visual Computing (CVC), and Chief Scientist of the Center of Excellence in Wireless and Information Technology (CEWIT) at the State

## Keynote Speech

University of New York at Stony Brook (aka Stony Brook University). He has conducted research for over 35 years in computer graphics and visualization and their applications, has published more than 300 refereed papers, books, and chapters, has delivered more than 20 invited keynote/plenary talks, has been awarded/filed more than 40 patents, and has been a principal/co-principal investigator on more than 100 research grants. He is a Fellow of IEEE, a Fellow of ACM, and the recipient of the IEEE Visualization Career Award (2005) as well as numerous other awards. He was the founding Editor-in-Chief of the IEEE Transactions on Visualization and Computer Graphics (TVCG), 1995-1998. He has been the co-founder/papers co-chair of IEEE Visualization Conferences; Volume Graphics Workshops, Eurographics/SIGGRAPH Graphics Hardware Workshops, and ACM Volume Visualization Symposia. He previously chaired and is currently a director of IEEE CS Technical Committee on Visualization and Graphics. He received a PhD in Computer Science from the Ben-Gurion University, Israel, in 1977. For more information, please visit: <http://www.cs.sunysb.edu/~ari>.



## Keynote Speech II

Day 3 9:00-10:00

### **New Approaches to Large Data Visualization**

Kwan-Liu Ma, University of California, Davis

Advanced computing and imaging technologies enable scientists to study natural and physical phenomena at unprecedented precision, resulting in an explosive growth of data. Furthermore, the size of the collected information about the Internet and mobile device users is expected to be even greater, a daunting challenge we must address in order to make sense and maximize utilization of all the available information for decision making and knowledge discovery. I will introduce a few new approaches to large data visualization for revealing hidden structures and gleaning insights from large, complex data found in many areas of study.

Bio:

Dr. Kwan-Liu Ma is a professor of computer science and the chair of the Graduate Group in Computer Science (GGCS) at the University of California-Davis. He leads the VID I (Visualization and Interface Design Innovation) research group, and directs the DOE SciDAC Institute for Ultra-Scale Visualization. His research spans the fields of visualization, computer graphics, and high-performance computing. Professor Ma received his PhD in computer science from the University of Utah in 1993. Before he joined UC Davis in 1999, he was with ICASE/NASA Langley Research Center as a research scientist. Professor Ma is presently leading a team of 30 researchers working on projects in large data visualization, information visualization, visual interface design, artistically inspired illustrations, video processing, and volume visualization. He has received several awards for his outstanding research accomplishments including the prestigious PECASE award. Professor Ma has been actively serving the research community by playing leading roles in several professional activities including the Workshop on Visualization for Cyber Security, the SC Workshop on Ultra-Scale Visualization, the Eurographics Symposium on Parallel Graphics and Visualization, the IEEE Visualization Conference, and the IEEE Pacific Visualization Symposium. Professor Ma also serves on the editorial boards of the IEEE Computer Graphics and Applications (CG&A), the IEEE Transactions on Visualization and Computer Graphics (TVCG), and the Journal of Computational Science and Discovery.

## Keynote Speech III

Day 4 9:00-10:00

### **Why Everyone seems to be using Spring Embedders for Network Visualization, and should not**

Ulrik Brandes, University of Konstanz

The main algorithmic challenge in network visualization is the placement of nodes. While plenty of layout algorithms have been proposed, the vast majority of information visualization tools appears to utilize (sometimes a variant of) one of two algorithms: the approach of Fruchterman and Reingold or that of Kamada and Kawai. Both are often referred to as force-directed methods, or spring embedders, and praised for their general applicability, high adaptability, and simplicity. I will argue that commonly used implementations and even the approaches themselves are outdated and, in fact, have always been. They should be replaced by variants of multidimensional scaling that display superior results and scalability, and are just as flexible and easy to implement. Some of these statements may actually be backed by evidence.

Bio:

Ulrik Brandes is a Professor of Computer Science at the University of Konstanz. With a background in algorithmics, his main interests are in network analysis and visualization, with application to social networks in particular. He is a member of the Graph Drawing Steering Committee, the board of directors of the International Network for Social Network Analysis (INSNA), and the editorial board of the Journal of Graph Algorithms and Applications, as well as an associate editor of Social Networks. He was recently awarded a prestigious Reinhart Koselleck-Project by Deutsche Forschungsgemeinschaft (DFG), and co-directs a transfer center for network research methods.

## Session 1

Day 2 10:20-12:00

### Volume Rendering and Navigation

Chair — Wei Chen, Zhejiang University

Full-Resolution Interactive CPU Volume Rendering with Coherent BVH Traversal

Aaron Knoll, Sebastian Thelen, Ingo Wald, Charles Hansen, Hans Hagen, Michael Papka

Context-Aware Volume Navigation

Stefan Diepenbrock, Timo Ropinski, Klaus Hinrichs

Multi-Dimensional Transfer Function Design based on Flexible Dimension Projection  
Embedded in Parallel Coordinates

Hanqi Guo, He Xiao, Xiaoru Yuan

Static Correlation Visualization for Large Time-Varying Volume Data

Cheng-Kai Chen, Chaoli Wang, Kwan-Liu Ma, Andrew Wittenberg

## Session 2

Day 2 13:30-15:10

### Visualization in Medicine and Natural Sciences

Chair — Shigeo Takahashi, University of Tokyo

The Neuron Navigator: Exploring the Information Pathway through the Neural Maze

Ching-Yao Lin, Kuen-Long Tsai, Sheng-Chuan Wang, Chang-Huain Hsieh, Hsiu-Ming Chang,  
Ann-Shyn Chiang

CareCruiser: Exploring and Visualizing Plans, Events, and Effects Interactively

Theresia Gschwandtner, Wolfgang Aigner, Katharina Kaiser, Silvia Miksch, Andreas Seyfang

Loose Capacity-Constrained Representatives for the Qualitative Visual Analysis in  
Molecular Dynamics

Steffen Frey, Thomas Schlömer, Sebastian Grottel, Carsten Dachsbacher, Oliver Deussen,  
Thomas Ertl

Interactive Seismic Interpretation with Piecewise Global Energy Minimization

Thomas Höllt, Johanna Beyer, Fritz Gschwandtner, Philipp Muigg, Helmut Doleisch,  
Gabor Heinemann, Markus Hadwiger

## Session 3

Day 2 15:30-17:35

### Vector Fields and Flow Visualization

Chair — Ye Zhao, Kent State University

#### Uncertain Topology of 3D Vector Fields

Mathias Otto, Tobias Germer, Holger Theisel

#### Edge Maps: Representing Flow with Bounded Error

Harsh Bhatia, Shreeraj Jadhav, Peer-Timo Bremer, Guoning Chen, Joshua Levine,  
Luis Gustavo Nonato, Valerio Pascucci

#### View Point Evaluation and Streamline Filtering for Flow Visualization

Teng-Yok Lee, Oleg Mishchenko, Han-Wei Shen, Roger Crawfis

#### Dual Space Analysis of Turbulent Combustion Particle Data

Jishang Wei, Hongfeng Yu, Ray W. Grout, Jacqueline H. Chen, Kwan-Liu Ma

#### Analyzing Information Transfer in Time-Varying Multivariate Data

Chaoli Wang, Hongfeng Yu, Ray Grout, Kwan-Liu Ma, Jacqueline Chen

## Session 4

Day 3 10:20-12:00

### Collaboration and Text

Chair — Jinwook Seo, Seoul National University

#### Impact of Group Size on Spatial Structure Understanding Tasks

Taylor Sando, Melanie Tory, Pourang Irani

#### Collaborative Information Linking: Bridging Knowledge Gaps between Users by Linking across Applications

Manuela Waldner, Dieter Schmalstieg

#### The NETSPEAK WORDGRAPH: Visualizing Keywords in Context

Patrick Riehm, Henning Gruendl, Bernd Froehlich, Martin Potthast, Martin Trenkmann,  
Benno Stein

#### STREAMIT: Dynamic Visualization and Interactive Exploration of Text Streams

Jamal Alsakran, Yang Chen, Ye Zhao, Jing Yang, Dongning Luo

## Session 5

Day 3 15:50-17:55

### Space and Time

Chair — Shixia Liu, Microsoft Research Asia

#### Exploring Geo-Temporal Differences Using GTdiff

Orland Hoerber, Garnett Wilson, Simon Harding, René Enguehard, Rodolphe Devillers

#### Interactive Visualization of Multivariate Trajectory Data with Density Maps

Roeland Scheepens, Niels Willems, Huub van de Wetering, Jarke J. van Wijk

#### Visualizing Dynamic Data with Maps

Daisuke Mashima, Stephen Kobourov, Yifan Hu

#### TripVista: Triple Perspective Visual Trajectory Analytics and Its Application on Microscopic Traffic Data at a Road Intersection

Hanqi Guo, Zuchao Wang, Bowen Yu, Huijing Zhao, Xiaoru Yuan

#### Interactive Visualization of Streaming Data with Kernel Density Estimation

Ove Daae Lampe, Helwig Hauser

## Session 6

Day 4 10:20-12:00

### Graph Visualization

Chair — Ulrik Brandes, University of Konstanz

#### Dynamic Network Visualization in 1.5D

Lei Shi, Chen Wang, Zhen Wen

#### Multilevel Agglomerative Edge Bundling for Visualizing Large Graphs

Emden Gansner, Yifan Hu, Stephen North, Carlos Scheidegger

#### An Extended Evaluation of the Readability of Tapered, Animated, and Textured Directed-Edge Representations in Node-Link Graphs

Danny Holten, Petra Isenberg, Jarke J. van Wijk, Jean-Daniel Fekete

#### An Advanced Network Visualization System for Financial Crime Detection

Walter Didimo, Giuseppe Liotta, Fabrizio Montecchiani, Pietro Palladino

## Poster Fast Forward

Day 2 17:40-18:00

## Poster Sessions

Day 2 18:00-20:00

Day 3 15:00-15:50

Chair

Takayuki Itoh, Ochanomizu University

Xiaoru Yuan, Peking University

Visualization of Large Astrophysical Simulations Data with SDvision

B Thooris, D. Pomarède

A PID Control-Based Scheme for Time-Critical Rendering of Particle Systems

Yuriko Takeshima, Issei Fujishiro, Takashi Tokumasu

A Study on Visualization for EFD/CFD Integration

Saki Kasamatsu, Takayuki Itoh, Shigeya Watanabe, Shigeru Kuchi-ishi, Kanako Yasue

An Educational System of Scientific Visualization Techniques Using Microsoft Excel Spreadsheets

Naohisa Sakamoto, Koji Koyamada

Interpolation of 3D Diffusion Tensor Fields by Locating Degenerate Lines

Chongke Bi, Shigeo Takahashi, Issei Fujishiro

Importance-Driven Multi-Resolution Volume Rendering

Jianfeng Xue, Ronghua Liang, Bing Xu, Wei Chen

Visualization of multidimensional uncertainty by integration of Parallel Coordinates and Star Glyphs

Huaiqing He, Lei Yang

### 3D Time-Varying Data Visualization Technique Featuring Symbolic Aggregate Approximation Method

Maiko Imoto, Takayuki Itoh

### ImageCube: An Image Browser Featuring a Multi-dimensional Data Visualization Technique

Zheng Yunzhu, Ai Gomi, Takayuki Itoh

### PLUM: A Photograph Browser with a Layout-Upon-Maps Algorithm

Kana Shiratori, Takayuki Itoh, Satoshi Nakamura

### Parallel Coordinates on iPad

Bowen Yu, Xiaoru Yuan

### Multi-touch System Used in Visualization

Yadong Wu, Qingan Yan, Jie Fu, Hongli Deng, Lili Song

### Visual analysis case study of academic co-author network

Xin Zhang, Limei Che, Rongjian Lan, Xiaoru Yuan

### A Genetic-based Method for External Labeling on Metro Map

Hsiang-Yun Wu, Shigeo Takahashi, Chun-Cheng Lin, Hsu-Chun Yen

### Spatiotemporal Visual Analysis of Sensor Networks in the Wild

Qi Liao, Lei Shi, Yuan He, Zhong Su, Aaron Striegel

### Colorscore - Visualization and Condensation of Structure of Classical Music

Aki Hayashi, Takayuki Itoh, Masaki Matsubara

### MusiCube: A Music Selection Interface featuring Interactive Evolutionary Computing in Feature Spaces

Yuri Saito, Takayuki Itoh

### Visual Analysis of People's Calling Network from CDR data

Yueqi Hu, Guizhen Wang, Ronghua Liang, Guangyu Chen, Dichao Peng, Wei Chen

### Interactive Visualization of 160 Years' Global Hurricane Trajectory Data

Zuchao Wang, Hanqi Guo, Bowen Yu, Xiaoru Yuan

## **Visualization Research in Asia Pacific**

Day 3 13:30-15:00

### Panelists

Issei Fujishiro, Keio University

Seok-Hee Hong, University of Sydney

Tung-Ju Hsieh, National Taipei University of Technology

Shixia Liu, Microsoft Research Asia

Qunsheng Peng, Zhejiang University

Huamin Qu, Hong Kong University of Science and Technology

Jinwook Seo, Seoul National University



# Banquet

## Banquet

Day 3 18:00 - 21:00

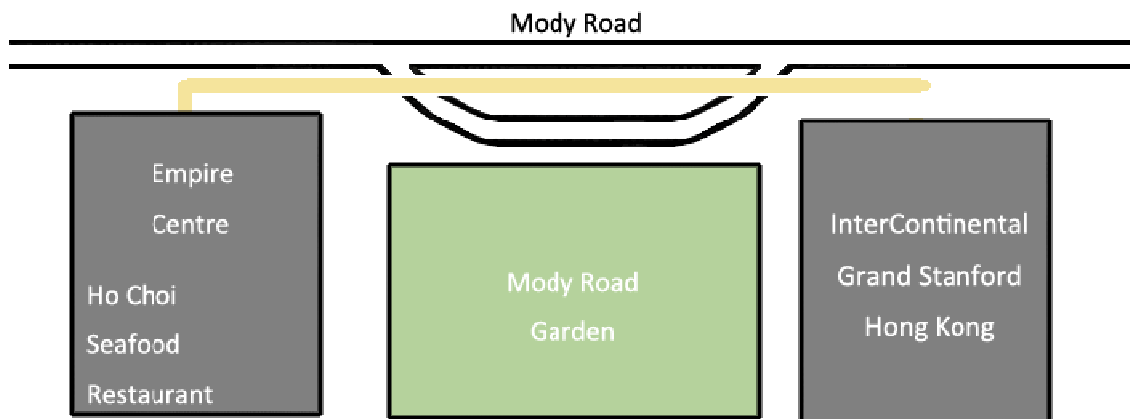
### Ho Choi Seafood Restaurant

UG/F, Empire Centre, 68 Mody Road, Tsim Sha Tsui East

好彩海鮮酒家

尖沙咀麼地道 68 號帝國中心地下高層 UG1

The restaurant is located to the south west of InterContinental Grand Stanford Hong Kong Hotel. It takes no more than 5 minutes by walk from the conference venue.



IEEE Pacific Visualization 2011  
The 4th Pacific Visualization Symposium (PacificVis 2011)  
March 1-4, 2011, in Hong Kong

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