Krishna Bharat

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RESEARCH INTERESTS

User interfaces, Distributed Computing, Interactive Application Builders, Constraint Systems, UI Animation, Hypermedia, Collaborative Work, Windowing Systems, Embedded Scripting Languages, Agent Programming, Migratory Applications, UI Languages/Toolkits, Personalized Electronic Newspapers, Information Visualization, Multimedia Indexing, Video Conferencing.

EDUCATION

Jun 1996	Ph.d. CS,	Georgia Institute of Technology	4.0 / 4.0 (current GPA)
Apr 1993	M.S. CS,	Georgia Institute of Technology	4.0 / 4.0
Jun 1991	B.Tech. CS&Engg,	Indian Institute of Technology, Madras	9.1 / 10.0 (CS) 8.7 / 10.0 (CS&Engg)

Phd Thesis: Supporting the Construction of Distributed, Interoperative User Interface Applications.
B.Tech Thesis: A Language and Multi-view Designer for 2 1/2D Interpolated Keyframe Animation.

PUBLICATIONS

Tomonari Kamba, Krishna Bharat, and Michael Albers, **The Krakatoa Chronicle: An Interactive, Personalized Newspaper on the Web**, *Proceedings of the Fourth International WWW Conference*, December 11-14, 1995, Boston, Massachusetts, USA.

Krishna Bharat and Luca Cardelli, **Distributed Applications in a Hypermedia Setting**, *Proceedings of the International Workshop on Hypermedia Design*, Montpelier France, Jun 1995.

Krishna Bharat and Luca Cardelli, **Migratory Applications**, *Proceedings of ACM Symposium on User Interface Software and Technology '95*, pp. 133-142, Pittsburgh PA.

Krishna Bharat and Scott E. Hudson, **Supporting Distributed, Concurrent, One-Way Constraints in User Interface Applications**, *Proceedings of ACM Symposium on User Interface Software and Technology '95*, pp. 121-132, Pittsburgh PA.

Krishna Bharat and Marc H. Brown, **Building A Distributed Application Using Visual Obliq**, *SIGCHI'95, Video Proceedings*, Denver CO. (Also *Digital SRC Tech Report #130b*)

Krishna Bharat, Scott E. Hudson, and Noi Sukaviriya, **Synthesized Interaction on the X Window System**, *GVU Center, Georgia Tech, Technical Report #95-07*.

Krishna Bharat and Marc H. Brown, **Building Distributed, Multi-User Applications by Direct Manipulation**, *Proceedings of ACM Symposium on User Interface Software and Technology '94*, Marina Del Rey, CA. (Also *Digital SRC, Tech Report #130a*)

James Pitkow and Krishna Bharat, **WEBVIZ - A Tool for World-Wide Web Log Analysis**, *Proceedings of the First WWW Conference, '94*.

Krishna Bharat and Noi Sukaviriya, **Animating User Interfaces Using Animation Servers**, *Proceedings of ACM Symposium on User Interface Software and Technology* '93, Atlanta GA

R. Victor Klassen and Krishna Bharat, **Correcting for Short-Range Spatial Non-Linearities of Output Devices**, *Proceedings of SIGGRAPH '93*, Anaheim CA.

Noi Sukaviriya, Krishna Bharat and Ellen Isaacs, **Multimedia Help - A Prototype and an Experiment**, *Proceedings of SIGCHI '92,* Monterey CA.

RESEARCH WORK IN INDUSTRY

Summer 1995: Research Intern at Sun Microsystems Labs, Boston - Java State Pickling

Extended the Java runtime with support for capturing and transmitting application state by a flexible 'pickling' mechanism. This will support interactive, agent-style computation in Java, including an adaptation of my 'Migratory Applications' work from '94 (see next item).

Status: Patent applications under way. Yet to be published.
Ref: Jim Waldo, waldo@east.sun.com

Summer 1994: Research Intern at Digital, Systems Research Center - Visual Obliq Project (II)

Further work on the Visual Obliq project (see next item):

(i) Integrated Visual Obliq with the World Wide Web, enabling distributed applications to be launched via the WWW, and allowing users to monitor and join sessions using the web,

(ii) Implemented a Safe-Interpreter for Obliq code that comes over the wire, and

(iii) Created support for 'Migratory Applications' - GUI applications that can migrate to new machines with the state of their user interface intact.

Status: Paper in IWHD '95. 'Migratory Applications' paper in UIST '95.
Ref: Luca Cardelli, `luca@src.dec.com`

Summer 1993: Research Intern at Digital, Systems Research Center - Visual Obliq Project

Conceived and implemented the Visual Obliq project. Visual Obliq is a design cum programming environment for building distributed, multi-user GUI applications by direct manipulation. Stand-alone code is generated in the distributed scripting language, Obliq.

Status: Paper in UIST '94, Video in CHI '95.
Ref: Marc H. Brown, `mhb@src.dec.com`

Summer 1992: Research Intern at Imaging Systems Lab, Xerox, WRC - Compensated Imaging

Developed image processing techniques to compensate for non-linearities in raster displays and non-impact printers.

Status: Paper in SIGGRAPH '93, U.S. Patent, European Patent Pending.
Ref: R. Victor Klassen, `R_Victor_Klassen.Wbst128@xerox.com`

RESEARCH WORK AT GEORGIA TECH

Doppler: An Algorithm for Maintaining Distributed, Concurrent, One-way Constraints.

Designed and implemented a distributed algorithm for supporting concurrent reads, writes and mutations to a directed constraint graph distributed over a number of processes. The algorithm relies solely on message passing, does not require synchronized clocks, and delivers causal consistency. It is provably optimal in terms of concurrency.

Status: Paper in UIST '95.
Ref: Scott E. Hudson, `hudson@cc.gatech.edu`

ENews: Personalized, Interactive, Electronic News.

Designed and implemented a Java based personalized electronic newspaper. News feed from the North Carolina newspaper, 'News and Observer', is indexed and used to create personalized newspapers for a community of users, based on personal user profiles. A Java applet displays the newspaper with a customizable, multi-column layout. The agent observes each user's actions and feedback, and updates their profile based on the apparent interest in various subjects. The view can be varied continuously from "Completely Personal" to "Community View" (or "Editor's View" if one is available).

Status: Paper in the 4th WWW Conference (Dec '95).
Ref: Tomonari Kamba, `kamba@mmp.CL.nec.co.jp`

User Interface Animation.

Designed and implemented a scripting language and architecture for synthesizing interaction in a graphical user interface environment (specifically for the X window system). Used for providing context-sensitive help.

Status: Paper in UIST '93, Later work in GVU-Technical Report # 95-07.
Ref: Noi Sukaviriya, `noi@cc.gatech.edu`

EXPERIENCE IN HUMAN-COMPUTER INTERACTION

My research has touched upon the following areas in HCI (listed chronologically):

- Animated User Interfaces, Animated Help, Multimedia Help, Usability Evaluation of Help Systems.
- Visualizing the WWW.
- Collaborative Work, Distributed User Interface Applications, Constructing Distributed GUI Applications by Direct Manipulation, GUI Builders.
- Distributed Applications on the WWW, Multi-User Sessions as Microcosms within the Web.
- Agent Style Multi-User Applications, Migratory Applications, Ubiquitous Computing.
- Constraint-based User Interfaces, Constraints in Visualization and Collaborative Work, Distributed Constraint Systems.
- Community Based News Filtering, Web Newspapers, Personalized News, Interactive Layout and User Input Monitoring.

REFERENCES

Scott E. Hudson
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