

## BILL BUXTON

### – Biography, Publications, Research collaboration –

#### BIOGRAPHY

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Bill Buxton is a *Designer* and *Researcher* interested in the human aspects of technology. His work shows a particular focus in technologies for filmmaking, music, design and animation. His research specialties include techniques and theories of computer input, technology mediated human-human collaboration, and ubiquitous computing.

Buxton began as a music student working with electronic synthesizers, at Queen's University, Canada. After completing his Bachelor's degree in Music, his passion for designing his own digital musical instruments led him to the University of Toronto, where he received a Master's degree in Computer Science. Later he joined the university's research department where he specialized and made advances in areas like pen-based computing, two-handed input and other methods of interacting with computers, becoming a pioneer in Human-Computer Interaction.

He joined Microsoft in 2005 as Principal Researcher at Microsoft Research. Prior to that, he was Principal of his own boutique design and consulting firm, *Buxton Design*. He has played different roles in his career, from being a researcher at Xerox PARC, to professor at the University of Toronto, and Chief Scientist at Alias Research and SGI Inc., among others.

#### Achievements:

- In 1995, he received the **Canadian Human-Computer Communications Society Award** for contributions to research in computer graphics and human-computer interaction.
- In 2000, he was given the **New Media Visionary of the Year Award** at the *Canadian New Media Awards*.
- In 2001, the *Hollywood Reporter* named him **one of the 10 most influential innovators in Hollywood**.
- In 2002, *Time Magazine* named Buxton **one of the top 5 designers in Canada**.
- In 2005, Bill Buxton and Gord Kurtenbach received the "**Lasting Impact Award**", from Association for Computing Machinery (ACM) UIST.
- In 2008, he became the **10th recipient of the ACM SIGCHI Lifetime Achievement Award**, "for fundamental contributions to the field of Computer Human Interaction".
- In 2009, he was elected **Fellow of ACM**, for his contributions to the field of human-computer interaction.
- In 2010, he was appointed **Doctor of Industrial Design Honoris Causa** by the Technical University of Eindhoven, The Netherlands.

#### IMPORTANT PUBLICATIONS - Overview and impact

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Buxton has published 24 publications between 1989 and 2010. Of particular importance are the publications written in collaboration with Gordon Kurtenbach: *The Limits Of Expert Performance Using Hierarchic Marking Menus* (1993) and *User Learning and Performance with Marking Menus* (1994) – contributing to the invention and analysis of the **marking menu** (a technique that allows the user to select a menu by popping up a radial (or pie) menu, or by making a straight mark in the direction of the desired area).

Another important series of publications that offer essential information around touch technologies are: *Multi-Touch Systems that I Have Known and Loved* (original: 2007, new version: 2011) and *Pen + Touch = New Tools* (2010), where he analyses the strengths and weaknesses of the devices with "**touch**" attributes and offers a thorough examination of **multi-touch interaction** (e.g., "Orientation Matters - Horizontal vs Vertical", "Hands and fingers vs Objects").

The only book published by Bill Buxton, *Sketching User Experiences: Getting the Design Right and the Right Design* (2007) has become a “must-have” reference for User Experience practitioners. The book offers thoughtful ideas over the best design processes and highlights the importance of iterative and lightweight sketching and prototyping.

## Bill Buxton, The “Prince” Technique: Fitts’ Law and Selection Using Area Cursors - Arguments and implications

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Fitts’ law is a model of human movement primarily used in human–computer interaction and ergonomics proposed by Paul Fitts in 1954. The concept predicts that the time required to rapidly move to a target area is a function of the distance to the target and the size of the target. Fitts’s law is used to model the act of pointing, either by physically touching an object with a hand or finger, or virtually, by pointing to an object on a computer monitor using a pointing device.

In most GUIs, selection is effected by placing the point of the mouse-driven cursor over the area of the object to be selected. As the width of the target area gets smaller, the index of difficulty of the task increases. The extreme case of this is when the target is a point. In this paper, Buxton shows that selection in such cases can be facilitated if the cursor is an area, rather than a point. Furthermore, he shows that when the target is a point and the width of the cursor is wide Fitts’ law still holds.

An alternative approach to pointing, called the *Prince technique*, was investigated by Buxton et al. and found to be comparable to traditional pointing methods. Because the Prince technique uses a cursor of large area or volume, it is suitable for tasks that are normally difficult with the standard pointer, such as acquiring small targets or points. Buxton proposes that the Prince technique may be especially valuable when used in conjunction with traditional pointing techniques, where it can be used to tailor task difficulty more closely to the accuracy demands of the task.

## Research collaboration

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Bill Buxton collaborated with Jonathan Grudin, a Computer science researcher at Microsoft Research, among others on writing a book on human-computer interaction - *Readings in Human-Computer Interaction: Toward the Year 2000* (1995). The book talks about the effectiveness of user-computer interface as it has become the most important factor in the success or failure of any system.

It provides a comprehensive overview on:

- **Human-computer interaction** - historical, intellectual, and social
- **Developing interactive systems** - including design, evaluation methods, and development tools
- **The interaction experience through a variety of sensory modalities** - including vision, touch, gesture, audition, speech, and language
- **Theories of information processing and issues of human-computer fit**

The book serves as an invaluable resource for systems designers, cognitive scientists, computer scientists, managers, and anyone concerned with the efficiency of user-computer interfaces.

## References

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[http://www.interaction-design.org/prINTERfriendly/references/authors/bill\\_buxton.html](http://www.interaction-design.org/prINTERfriendly/references/authors/bill_buxton.html)

<http://billbuxton.com/isscc2008buxton.pdf>

Kabbash, P. & Buxton, W. (1995). *The “Prince” Technique: Fitts’ Law and Selection Using Area Cursors*. Proceedings of CHI’95, 273-279.

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[http://www.interaction-design.org/references/authors/jonathan\\_grudin.html](http://www.interaction-design.org/references/authors/jonathan_grudin.html)