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| In re Patent of: | Peter S. Wilens |
| U.S. Patent No.: | 5,779,566 |
| Issue Date: | July 14, 1998 |
| Appl. No.: | 08/392,280 |
| Filing Date: | February 22, 1995 |
| Title: | Handheld Golf Reporting and Statistical Analysis Apparatus and Method |

# DECLARATION OF PROFESSOR CARL A. GUTWIN, Ph.D.

I, Prof. Carl A. Gutwin, Ph.D., declare as follows:

## I. Background and Qualifications

(1.) My name is Carl A. Gutwin, Ph.D. I am a Professor of Computer Science at the University of Saskatchewan in Saskatoon, Canada. I am also an Adjunct Professor of Computer Science at Queen's University in Kingston, Canada. I have been a professor at the University of Saskatchewan since 1997.

(2.) I received my Doctor of Philosophy (Ph.D.) degree in the field of Computer Science from the University of Calgary in 1997. I received my Masters of Science (M.Sc.) degree in Computer Science from the University of Saskatchewan in 1991 and my Bachelors of Science (B.Sc.) degree in English Literature and Computer Science from the University of Saskatchewan in 1988.

(3.) For more than 20 years, I have studied, designed, and worked in the field of computer science and computer-human interaction ("CHI," also known as

human-computer interaction ("HCI")). My experience includes over 20 years of teaching and research, with interests in interface design, interaction techniques, and interactive systems organization, just to name a few.

(4.) I have designed and implemented dozens of software systems that use interface and interaction elements that are utilized by the device described in U.S. Patent No. 5,779,566 ("the '566 patent"). Included among these are numerous systems developed as a student, since menu-based and screen-based systems were part of most course assignments and projects in the 1980s. In addition, over the course of my research career, I have also been involved in the development of several software systems that involve these interactive elements. For example, the Gemini training system (Gutwin, Jones, Brackett, and Adolphe 1995) involved user selection of screens of information, entry of user information into entry fields, and different paths through system content based on selections made by the user. The Kea keyphrase-extraction system (Witten, Paynter, Frank, Gutwin, and Nevill-Manning, 2004) provides functionality for the user to enter input data, and presents screens of information based on that user input. The KeyPhind system for creating and presenting a phrase-based index to a document collection (Gutwin, Paynter, Witten, Nevill-Manning, and Frank, 1999) provided input fields for user data and selection of screens of information based on user input. The RTChess system for multi-player chess (Gutwin, Barjawi, and Pinelle, 2012) provides pre-task, during-

task, and post-task screens of information, and allows users to specify data values during the pre-game screens. Although the interfaces of these systems are often graphical and mouse-based, they still contain the basic elements that are relevant to the '566 patent, such as selection and retrieval of content, presentation of screens of information, navigation through system content, entry of user data, and selection of values from sets of items.

(5.) As an instructor of Computer Science courses (particularly courses in the design and development of user interfaces), I have developed several additional systems as educational demonstrations that use these interface and interaction elements. For example, I have developed menu-based systems that use key-based user input, systems that allow selection of one value from a list of items, systems that select content based on key input, and systems that present linear and non-linear sequences of information screens to the user. Finally, I note that I continue to employ many of the user interface design concepts generally described by the '566 patent because they represent many of the widely utilized design elements common to menu-based and screen-based systems which, as I describe below in paragraphs 15-35, were ubiquitously well-known years prior to the filing of the '566 patent.

(6.) In 2012, I was inducted into the Association of Computer Machinery ("ACM") CHI Academy, which is an honorary group of individuals who have

made substantial contributions to the field of computer-human interaction. Members of the CHI Academy are the principal leaders of the field, whose efforts have shaped the discipline and/or industry, and lead research and/or innovation in CHI. I also regularly serve as a reviewer for 6 journals focusing on CHI, another 9 conferences focusing on the same, and have held and continue to hold various chairman and committee positions within these organizations.

(7.) I am the author or co-author of 3 book chapters and over 150 technical articles directed to computer-human interaction. Many of these publications highlight my familiarity with designing software applications using menu structure designs and functionality. Below is a list of my publications that are relevant to the interface and interaction elements discussed in the '566 patent:

> (1.) (Cockburn and Gutwin, 2010, "A Model of Novice and Expert Navigation Performance in Constrained-Input Interfaces"). This article examines and models user abilities when selecting items and navigating through screens of information using devices with limited key-based input.
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> (2.) (Cockburn and Gutwin, 2009, "A Predictive Model of Human Performance with Scrolling and Hierarchical Lists"). This article examines and models user abilities when scrolling through lists of pre-determined items and selecting items from the list. Both key-based and mouse-based navigation and selection are considered.
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> (3.) (Hill and Gutwin, 2004, "The MAUI Toolkit: Groupware Widgets for Group Awareness"). This article examined several basic interface widgets including entry fields and scrollable lists of items, and adapted these components to multi-user operation.
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> (4.) (Gutwin, Paynter, Witten, Nevill-Manning, and Frank, 1999, "Improving Browsing in Digital Libraries with Keyphrase Indexes"). This

article developed a system for retrieving screens of information from memory using a keyphrase-based index. The index allowed the user to select items and enter data as part of the retrieval process.

(5.) (Scarr, Cockburn, Gutwin, and Bunt, 2012, "Improving Command Selection with CommandMaps"). This article investigates how user selection of an item from a set of items can be improved with a new menu design that lays out items in a two-dimensional grid.

(6.) (Tak, Scarr, Gutwin, and Cockburn, 2011, "Supporting Window Switching with Spatially Consistent Thumbnail Zones"). This article investigates methods for retrieving screens of information from memory, and mechanisms for the user to select a specific screen from a set.

(7.) (Flatla and Gutwin, 2010, "Individual Models of Colour Differentiation"). This article develops a process for interactive testing of color vision, using a screen-based presentation, key-based entry of user information, and multiple paths through the calibration process based on user input.

(8.) (Ahlstrom, Cockburn, Gutwin, and Irani, 2010, "Why it's Quick to be Square: Modeling New and Existing Hierarchical Menu Designs"). This article explores user abilities in menu-based selection, using several menu designs.

(9.) (Cechanowicz and Gutwin, 2009, "Augmented Interactions: Adding Expressive Power to GUI Widgets"). This article develops a method for analyzing the interaction capabilities of interface components such as scrollable lists, selection mechanisms, and navigation mechanisms for moving through screens of information.

(10.) (Bateman, Gutwin, Osgood, and McCalla, 2009, "Interactive Usability Instrumentation"). This article develops techniques for collecting usage data from existing form-based screens that involve user selection, data entry, scrolling through lists of items, and navigation within a form.

(11.) (Cockburn, Gutwin, and Greenberg, 2007, "A Predictive Model of Menu Performance"). This article investigated and modeled user abilities when selecting items from menu structures.

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