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INC. and SAMSUNG
TELECOMMUNICATIONS AMERICA, LLC

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA, SAN JOSE DIVISION

APPLE INC., a California corporation,
 	
        Plaintiff,
 	
     vs.
 	
SAMSUNG ELECTRONICS CO., LTD., a Korean business entity; SAMSUNG ELECTRONICS AMERICA, INC., a New York corporation; SAMSUNG TELECOMMUNICATIONS AMERICA, LLC, a Delaware limited liability company,
 	
      Defendant.
	CASE NO. 11-cv-01846-LHK
	
	DECLARATION OF BENJAMIN B. BEDERSON
	
	Date: October 13, 2011
	Time: 1:30 p.m.
	Place: Courtroom 8, 4th Floor
	Judge: Hon. Lucy H. Koh

DECLARATION OF BENJAMIN B. BEDERSON

I, Benjamin B. Bederson, declare:

1.   I have personal knowledge of the facts set forth herein, and am competent to testify to the same.

2.   I am currently a Professor in the Computer Science Department and the Institute of Advanced Computer Studies at the University of Maryland, College Park. From June 2000 to September 2006, I was the Director of Human-Computer Interaction Lab (HCIL) at the University of Maryland. Before coming to the University of Maryland in 1998, I was an Assistant Professor in the Computer Science Department at the University of New Mexico, where my research included work on user interfaces. I have Doctorate and Master's degrees in computer science from New York University.

3.   While at the HCIL, I created several pieces of software that implemented different user interfaces that allowed humans to interact with mobile devices such as Personal Digital Assistants (PDAs) and cell phones, including those with touch-sensitive screens.

4.   While I was the director of the Human-Computer Interaction Lab, I led the team that created the software known as LaunchTile. I worked on this project along with Amy Karlson, Aaron Clamage, and John SanGiovanni. The majority of the code for LaunchTile was written by Amy Karlson and Aaron Clamage.

5.   The LaunchTile project was an attempt to design a one-handed solution for mobile interaction that would be useful on a stylus-free touch screen mobile device.

6.   We came up with the LaunchTile concept and began writing code for LaunchTile no later than mid-2004. I know this to be the case because we submitted a paper on the LaunchTile project for entry in the April 2005 ACM Conference on Human Factors in Computing Systems (the "CHI Conference"), which was accepted and published. I recall that papers for the April 2005 CHI Conference were due to be submitted in September 2004. I further recall that we were actively working on the LaunchTile paper during mid-2004, and that we had already begun coding before we began to draft this paper. I further recall that we had a working prototype of the

1 LaunchTile system operative before we submitted the paper – that is, we had a working prototype

2 at least as early as September 2004.

3   7.   Attached as Exhibit A is a true and correct copy of the paper we published as part

4 of the CHI Conference. A September 11, 2004 draft of that paper is attached as Exhibit B. We

5 submitted a draft by the September 13, 2004 deadline, which was identical to or substantially

6 similar to our September 11, 2004 draft. Our paper was accepted for publication in December

7 2004, as shown by correspondence with CHI Conference personnel, attached as Exhibit C. At the

8 time we submitted our paper to the CHI Conference, I was not aware of any legally binding

9 confidentiality or nondisclosure agreement that restricted the CHI Conference staff with respect to

10 our submission. I further understood that our submission would be reviewed by peers and

11 evaluated for possible inclusion in the conference. As part of that review process, I was not aware

12 of any legally binding confidentiality or nondisclosure agreement that restricted these reviewers

13 with respect to our submission. As shown in Exhibit C, a number of reviewers did in fact read and

14 comment on our submission.

15   8.   During the CHI Conference we presented our paper and discussed our research

16 freely with conference participants. A video demonstration of LaunchTile, which we included in

17 our presentation at the CHI Conference, is attached as Exhibit D. A set of PowerPoint slides that

18 we displayed during our presentation at the CHI Conference is attached as Exhibit E. Attached as

19 Exhibit F is an executable version of LaunchTile, which is identical or substantially similar to the

20 version of LaunchTile that we demonstrated in our video and discussed in our paper and

21 presentation at the CHI Conference.

22   9.   At the CHI Conference we discussed the functionality of a mobile device running

23 LaunchTile, including the properties of the LaunchTile device's user interface. The LaunchTile

24 program ran on mobile touch-screen devices, such as the Compaq iPaq line of handheld devices.

25 These devices included one or more processors and memory for storage. The main screen of a

26 LaunchTile device is an interactive "World" (also called the "zoomspace") consisting of 36

27 application "Tiles." This "World" is divided into 9 areas of 4 tiles each, each of which we refer to

28 as a "Zone." As shown below, the "World" view displays 9 "Zones":

World   **Zone**

10.   LaunchTile allows a user to select a particular Zone for viewing and then pan between Zones. From the World view a user can tap on a blue button corresponding to a particular Zone to select that Zone, which results in that Zone filling the entire screen. As shown above, this Zone contains 4 equally-sized tiles, each tile corresponding to an application. Tapping on a tile would launch that application. In our prototype implementation, these tiles were typically represented by one or more image files (.png files).

11.   To view other Zones, the user can pan to a neighboring Zone by touching the screen with a finger and dragging that finger across the screen. This gesture pans neighboring Zones into view.

12.   As part of the gesture described above, a user may "over-pan" or "under-pan" and thereby fail to align the four corners of a Zone precisely to the corners of the screen. When this occurs, LaunchTile will "snap" the over-panned or under-panned Zone such that the corners of the Zone are aligned to the corners of the device's display screen. This "snap," which is animated,

1 occurs when the gesture described above ends and the user's finger is no longer in contact with the

2 screen.

3   13.   For example, during a pan operation in a particular direction, LaunchTile may be

4 displaying a Zone or a portion of a Zone. The pan operation described above causes LaunchTile

5 to pan towards a neighboring Zone and display a portion of that neighboring Zone. If the user

6 then pans in the opposite direction, LaunchTile will pan in that opposite direction and may begin

7 to display a portion of a different neighboring Zone.
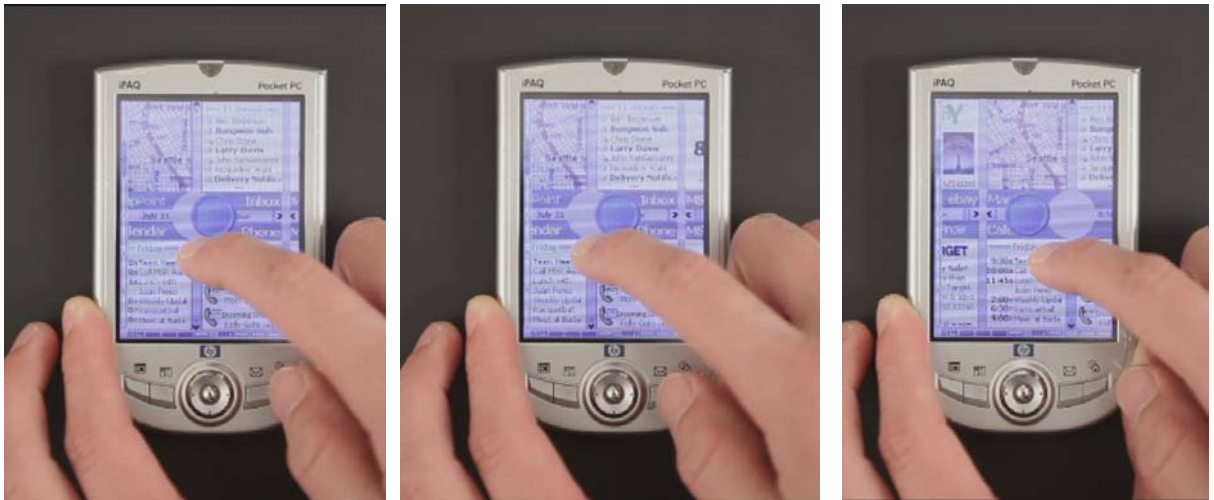
18   14.   Upon the completion of the operations described above, if the Zone is not scrolled

19 sufficiently in one direction (i.e., under-panned), LaunchTile will perform an animated "snap" so

20 that the original Zone is displayed in its entirety. In this way, LaunchTile ensures that the user is

21 never caught between Zones.

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15.   LaunchTile's prototype email application employs a similar solution to the "over-pan" problem. When a user selects the LaunchTile e-mail application prototype, he is presented with a vertical list of emails, as shown below:

16.   The vertical list of emails in the email application prototype is too long to display on the screen at once. LaunchTile therefore allows the user to scroll up and down through this list of emails by dragging up and down on the touchscreen, as shown below:

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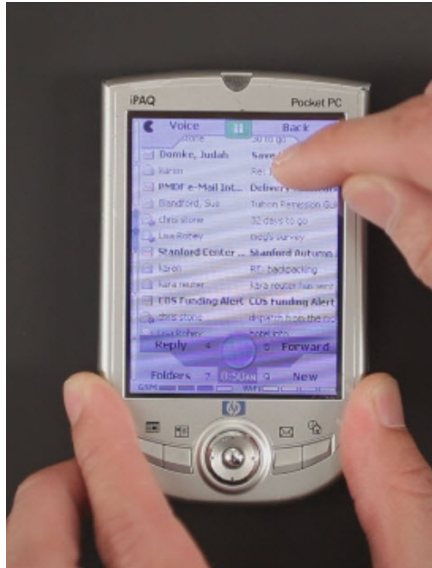
17.   When the user reaches the bottom of the e-mail list, the user may "over pan" beyond the end of the list, causing the user to view a visually distinct, solid-colored space beyond the end of the e-mail list. When this occurs, depending on the degree of the over-pan, LaunchTile may "snap" the e-mail list back into alignment, such that the last e-mail in the list is flush with the bottom of the e-mail application's display pane.

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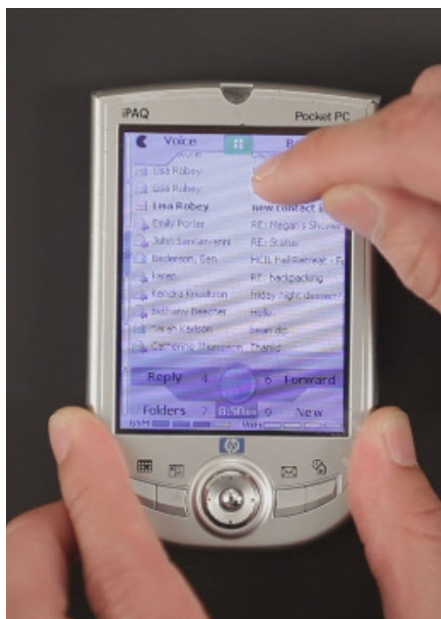
18.   In this prototype application, the e-mail list is comprised of multiple digital images (.png files), with each e-mail represented by an individual digital image file.

19.   While I was the director of the Human-Computer Interaction Lab, I also led the team that created the software known as XNav, which was a variant of the LaunchTile software. I worked on this project along with Amy Karlson, Aaron Clamage, and John SanGiovanni. The majority of the code was written by Aaron Clamage and Amy Karlson.

20.   XNav was meant to run on different mobile touch-screen devices and on different operating systems than LaunchTile. XNav was developed using the LaunchTile code base and had many of the same features. These features include identical or substantially similar functionality for "snapping" a Zone in response to a user's over-pan or under-pan command, as well as identical or substantially similar functionality to "snap" an email list in response to an over-pan or under-pan command.

21.   A copy of the source code for XNav is attached hereto as Exhibit G. An executable version of this source code is included in the "Bin" directory of Exhibit G. The date of this source code is no later than August 25, 2005.

22.   Relevant portions of the XNav source code performing the "snap" feature discussed above include ShellForm.cs at or around lines 746, 760 and 764, as well as Landscape.cs at or around lines 424-426 and 213-300, EmailListNode.cs at or around lines 282-288, and Email.cs at or around lines 1106-1119 and lines 1066-1097.

23.   At the CHI Conference in April 2005, in Portland Oregon, which was open to the public, I freely discussed my work with conference attendees without any confidentiality or nondisclosure agreements. This work included LaunchTile, as well as its "snap" and panning features.

24.   During our presentation at the CHI Conference, members of my team presented the paper that we had authored on LaunchTile, using PowerPoint slides and a video that demonstrated the LaunchTile software. The paper, the PowerPoint slides, and the video are attached hereto as Exhibits A, D, and E.

25.   In May 2005, HCIL hosted a symposium ("HCIL Symposium") where members of my team again presented our work, which included LaunchTile and its user interface features, including the "snap" and panning features discussed above. This HCIL Symposium was open to the public and I freely discussed my work with symposium attendees without any confidentiality or nondisclosure agreements.

26.   During the HCIL Symposium, members of my team presented the same paper that had been presented at the CHI Conference, including a public viewing of the same video used in our presentation at the 2005 CHI Conference. A set of PowerPoint slides that my team used for this HCIL Symposium presentation are attached as Exhibit H. In addition, I spent the afternoon session of the HCIL Symposium performing live demonstrations of a mobile touch-screen device running LaunchTile.

27.   Attached hereto as Exhibit I is a photograph of several members of the University of Maryland Human-Computer Interaction Lab at the May 2005 HCIL Symposium. This photograph memorializes our demonstration of the LaunchTile project at the conference in several ways: (a) our poster displaying the LaunchTile project can be seen in the upper right-hand corner; visible on the poster is an attribution to both myself and "Amy Karlson," as well as the words "[Des]igns for One-Handed"; (b) Amy Karlson, the primary coder for the LaunchTile project, is standing on the far right, with her name tag visible; (c) Amy Karlson is holding a mobile touch-screen device that ran LaunchTile in her hand; (d) several other gentlemen in the picture are wearing HCIL Symposium T-shirts and HCIL Symposium name-tags.

28.   On August 25, 2005, I provided a copy of the XNav source code to Microsoft employee John SanGiovanni. Attached hereto as Exhibit J is an email referencing the transmission of this source code. When I provided this source code to John SanGiovanni, I understood that Microsoft was free to use the code as they saw fit, including being able to reproduce, license, or distribute XNav to other third parties. Attached as Exhibit K is an email reflecting my understanding that Microsoft was not under a confidentiality or nondisclosure obligation with respect to this source code.

29.   No later than March 31, 2005, my team placed a video on a public website, http://www.cs.umd.edu/hcil/mobile/, demonstrating the use of LaunchTile and XNav. The video illustrates LaunchTile running on a Compaq iPaq device as well as XNav running on a Sony VGN-750P device. These devices included touch-screen displays and responded to movements of a finger on that touch-screen display, as shown in the video. This video is attached as Exhibit L. This video was available at the URL http://www.cs.umd.edu/hcil/mobile/launchtile.mov. I have reviewed web server logs for this website; according to these logs, this video was accessible to the public no later than May 2005. Relevant log information is contained in Exhibit M.

30.   I considered the "snap" and panning operations in LaunchTile and XNav described above to be a natural design choice for implementing a user interface on a touch screen mobile device that would be operated with one hand. Because the screens of mobile devices are small, it was natural and desirable to utilize as much of the device's screen as possible to display items such as Zones or e-mail lists. Because user panning operations are often imprecise, particularly in the context of a mobile touch-screen device with a relatively small screen, the user often will not align an item perfectly so that the desired view occupies the entire screen due to inaccuracies of finger gestures on a small touch screen. Because over-panning, under-panning, and other imprecise operations are expected, it seemed natural to correct a user's imprecise panning operations, so that the displayed item would be properly aligned and the item could be viewed using a larger area of the device's screen.
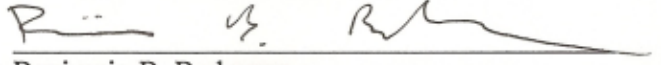
31.   In deciding what mechanism to use when correcting a user's imperfect panning operation on a touch screen mobile device, my team considered it natural to draw on user interface concepts that were well-known in other devices. These include physics-based metaphors for user interface design, such as the simulation of magnetism, gravity, friction, or other phenomena that influence a user's interaction with objects in the physical world. These metaphors are useful for creating user interfaces that are immediately intuitive; as I have explained in prior writings, an "empirical knowability naturally follows from a physics perspective" in user interface design. Bederson, B. B., & Hollan, J. D. (1994), *Pad++: A Zooming Graphical Interface for Exploring Alternate Interface Physics*, Proceedings of User Interface and Software Technology (UIST 94)

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1   ACM Press, pp. 17-26. In my experience, including my interactions with students and colleagues,

2   by 2004, techniques for using physics-based metaphors in user interfaces were well-known in the

3   field.

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I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: Aug 20, 2011

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Benjamin B. Bederson