**Gregg Vanderheiden delivers Keynote at International Human Computer Interface Conference (HCII 2020)**

**Gregg Vanderheiden,** Professor and Director of the Trace R&D Center at the University of Maryland’s iSchool, delivered the keynote address at the 22nd International Conference on Human-Computer Interaction July 21, 2020.  He highlighted a growing gap between current UI and UX design and people who have low “digital affinity,” and proposed an alternate approach to accessibility and extended usability for next-next generation UI/UX.

In his keynote Dr. Vanderheiden distinguished between digital literacy (a ***skill*** that can be acquired) and digital affinity (a ***talent*** that one has or doesn’t). Whereas digital literacy, because it is a skill, can be addressed through training and experience, he explained, while low digital affinity (the inherent inability to understand and use technology) is an innate talent or ability like intelligence or athletic ability that a person can make use of but either has to doesn’t have. As a result, people with very low digital affinity may have trouble using digital interfaces even with exposure and training. Low digital affinity is not, he said, the same as intelligence. “I know of people who are blazingly brighter than I am - and are leaders in their academic field - but cannot use their technologies.   But I can - even if I have not seen the technology before. Does that make me smarter than them?  No.” he explained. He further talked about people who do not have talent, or have very low talent, in an area, will block them from some fields of endeavor (e.g. singing if one is tone deaf, or professional athletics if one has no coordination). He noted that lack of digital affinity is more severe than lack of other talents because we are building digital interfaces into all areas of endeavor and into all of our modes of communication, e-commerce, education, health, and increasingly, most every activity of daily or independent living.  Hence, low digital affinity can have a much more limiting effect on a person that severe lack of talent or affinity in areas like music, art, athletics or even math.

Dr. Vanderheiden then went on to point out numerous examples of low digital affinity and its impact that were identified during their development of Morphic, an extension to the Windows and Mac Operating systems to make it easier to use computers, third party assistive technologies, and built-in accessibility and usability features.   He highlighted usability features that were needed by users, but that go unused even after users are aware of them because the features are too difficult to get to and use. He also cited a fear that many users have that they will ‘break the computer’ — causing them to be technology shy and not try anything new. He demonstrated the MorphicBar and how it uses layering and simplification to bring features forward where they are accessible with ‘one click’.   He also talked about using the MorphicBar to create an ‘ultra-simple’ interface for those who cannot use computers.   Buy creating a custom “always visible - one click interface’ to just the features and functions a user needs, he said that an interface could be created that could be used by people with even very low digital affinity - low enough that even today’s tablets would be confusing to them.    For example, combining what would otherwise be multiple actions like launching Skype, selecting a weekly family teleconference call, and starting it for them, into a single click — so that they could join the family call each week with a single click on an always visible button.   Other examples presented were one-click access to worship services, a family photo sharing slide show, a Facebook page or a favorite online site or magazine. He then explained how such strategies can help put key benefits of computers within the reach of people with low and very low digital affinity.

He then continued into the future - looking at what he called next-next-generation interfaces that would be appearing in 15-20 years.   He posited that current approaches to accessibility including both guidelines and practice, would not be sufficient to address these new technologies.   Dr. Vanderheiden explained that even today only a small percentage of the web pages and products on the market are accessible -- and that this will only decrease with the increased difficulty in providing access to next-next generation interface technologies like speech, gesture, and emotion recognition, virtual and augmented reality glasses, direct brain interfaces, etc.   He proposed consideration of a new approach involving the use of an open-source public ***Info-Bot*** that could understand and operate and digital Interfaces - coupled with Individual User Interface Generators (IUIGs) that would be capable of presenting a custom user interface to each user. Each time a user encountered an interface they could not understand or use - the IUIG would generate one for them that matched their skills and abilities and operated in a manner familiar to them. Dr. Vanderheiden suggested that such an approach would be difficult and require advances in science in a number of fields but would result in greatly reduced costs to industry while simultaneously providing more useable interfaces for a much wider range of types, degrees, and combinations of disability and digital affinity. It would also have the advantage over current approaches by providing these individually accessible interfaces for all products - even products from small companies who are not aware of accessibility or the needs of people with low digital affinity — or that feel they are too small to have the staff needed to address these groups. Thus, as long as any product could be used by the average user, it would be within reach of the proposed Info-Bot and could therefore be made accessible via the individual interface generators to anyone who could not use the standard interface. He noted that this was just the type of project that would match an NSF-like grand challenge since it both would drive advances in multiple sciences, provide a real-world problem to focus the work, and require a public-private partnership to address.