Guest Editors’ Introduction

Tablet PCs—are they? Are they just a fad, or do they really play a significant role in the computing milieu?

Wikipedia defines a Tablet PC as “a notebook- or slate-shaped mobile computer. Its touch screen or digitizing tablet technology allows the user to operate the computer with a stylus or digital pen or a fingertip instead of a keyboard or mouse. The form factor offers a more mobile way to interact with a computer. Tablet PCs are often used where normal notebooks are impractical or unwieldy, or do not provide the needed functionality.”

The Tablet PC concept is not new; the ideas behind pen-based computing hark back to visionaries such as Alan Kay, Butler Lampson, and Chuck Thacker and to innovative companies such as Xerox PARC in the late 1960s and early 1970s. Alan Kay’s Dynabook from 1968, shown in Figure 1, looks remarkably similar to today’s machines. But the technology just wasn’t ready—many attempts at pen-based computing failed due to an unsuitable user interface, inaccurate handwriting recognition, and a poor digitizer.

Microsoft entered the field in 1999 with its proof-of-concept machine, shown in Figure 2, which was based on the Transmeta TM5800 processor. With 256 Mbytes of RAM, a 20-Gbyte disk, and a 10.4-inch slate form factor, it pushed the power efficiency envelope by providing 5 hours of runtime (200 hours standby). But the machine was not a commercial success because it was so slow.

Now all that has changed. As the Gartner Group’s “Dataquest Insight: Tablet PCs Are Slowly Gaining Momentum” report indicates, Tablet PCs are here to stay (www.gartner.com). Whereas the insurance, healthcare, public safety, and real estate industries were the first users of tablet technology, Gartner suggests that the next big vertical enterprise to identify the usefulness of Tablet PCs will be higher education. “In the past two years, higher education faculty and students have been the main emerging users adopting the convertible tablet PCs,” the report states.

Early adopters in higher education have developed Tablet PC teaching platforms that incorporate active learning techniques and support in-class collaborations.

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Tablet PC Technology: The Next Generation

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Early adopters in higher education have developed Tablet PC teaching platforms that incorporate active learning techniques and support in-class teacher/student and student/student collaborations. Novel software is available to grade assignments, conduct online office hours, tutor circuit design, and illustrate concurrent programming—among many other applications.

IN THIS ISSUE

This issue of Computer presents five articles that look at tablet technology from the perspectives of application development, research, and instruction.

“Magic Paper: Sketch-Understanding Research” by Randy Davis describes how sketch understanding systems let users draw more naturally and with a freedom not available with CAD systems so that they can create informal figures as a way of thinking or working through a problem.

In “Ink, Improvisation, and Interactive Engagement: Learning with Tablets,” Jeremy Roschelle and colleagues discuss how today’s approaches to teaching have moved beyond the notion of learning as recollection to new metaphors and approaches. They describe how communities that form around platforms such as Classroom Presenter, GroupScribbles, and related applications should provide an excellent forum for advances in the use of tablets in educational settings.

In “Handwriting Recognition: Tablet PC Text Input,” Jay Pittman declares that pen-based computing is here now and describes how a large neural network trained on a very large training set containing ink samples from thousands of people with a diverse range of writing styles is being used to support poorly formed cursive script, providing amazing recognition accuracy, especially once users acclimate to writing with a plastic pen on a plastic screen.

“InClassroom Presenter: Enhancing Interactive Education and Collaboration with Digital Ink” by Richard Anderson and colleagues discusses a Tablet PC-based interaction system that supports the sharing of digital ink on slides between instructors and students and describes its use in classroom interaction scenarios. They demonstrate that the technology offers flexibility and a range of expression that can achieve a wide range of educational goals and foster a more participatory classroom environment.

In “Facilitating Pedagogical Practices through a Large-Scale Tablet PC Deployment,” Joe Tront describes the multifaceted, collaborative approach that faculty and students at the Virginia Tech College of Engineering are using. They have begun exploration of the use of Tablet PCs in engineering and computer science courses, working with an implementation process that includes computer acquisition, faculty training, infrastructure modifications, and multiple learning assessments. Preliminary results have been quite positive.

We hope that these articles will raise your awareness and curiosity about tablet technology and encourage you to think about how you might apply it in your own work. Thanks for your interest.

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