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BRIEFINGS

Industry News, Reports, and Items of Interest

How to Design a Full-Size Keyboard into a Device That's Half Its Size

Designing a notebook-computer-size keyboard into a cell phone or PDA half its size is a good bit easier when the keyboard is made of light. Combining electronic perception chips with projection technology, a new toolkit from **Canesta Inc.** (San Jose, CA; website) enables OEMs to equip gadgets like cell phones and PDAs with the power to project beams of light that "form" a keyboard on any nearby surface. The gadget would also be equipped with Canesta sensors that perceive the user's finger movements on the ray-of-light keyboard. As a result, a designer could engineer a notebook-computer-size keyboard into a gadget that otherwise couldn't handle anything bigger than a baby-finger-size keypad.

Canesta's ***Projection Keyboard OEM Development Toolkit*** includes an application testbed with the company's pattern projector and image sensor, drag-and-drop tools for designing keyboard layouts, sample drivers, and software that lets the manufacturer interface the toolkit to its device in progress.

Founded in 1999, Canesta reports that it has patents on a method for forming electronic images of objects in 3D. Unlike sensors in digital cameras, which see flat images, Canesta's can compute the distance from the sensor of every pixel in an image in real time. That technology has been implemented in a single CMOS chip, along with the company's proprietary image processing software. More information is available at canesta.com/downloads/toolkit.pdf.

Software Houses Testing Their Inventor Programs for "Quality, Interoperability"

More than 30 applications have passed the new certification program set up by **Autodesk** (San Rafael, CA; website) for testing applications that work with Inventor. The ***Autodesk Inventor Certified Application Program*** "certifies applications that have met standards set by Autodesk to ensure robustness, quality, and the highest level of interoperability" with Inventor, said Robert “Buzz” Kross, vice president of the Manufacturing Division at Autodesk.

Kross said more than 70 applications are in the queue for self-testing, which he described as a “Web certification program.” Programs thus far that have made the grade include Cfdesign (Blue Ridge Numerics), GibbsCAM (Gibbs and Associates), AutoManager Meridian (Cyco), and MSC.visualNastran 4D (MSC.Software). The list will range across 20 categories, Kross said, and include software for material analysis, behavioral modeling, sheet metal, moldmaking, product data management, and other applications.

Intel, et al.

Take Step Toward Standard for 3D Graphics on the Web

A common format for 3D graphics on the Web is possibly in sight. **Intel** (Santa Clara, CA; website) and allies that include several prominent developers of engineering software have formed the ***CAD 3-D Working Group*** to define and develop a standard for representing 3D images on the Web. The working group, part of the Web3D Consortium (web3d.org), includes CAD software vendors and CAD users.

“By working with industry leaders and graphics experts, we plan to create a format that will do for 3D what the JPEG format did for digital photography on the desktop," said Patrick Gelsinger, Intel vice president and chief technology officer.

In addition to Intel, the CAD 3D Working Group members include 3Dlabs, Actify, Adobe Systems, ATI Technologies, The Boeing Company, Dassault Systemes, i3Dimensions, Lattice Technology, Microsoft, National Institute of Standards and Technology (NIST), and Tech Soft America/OpenHSF, among others. The group expects to complete its initial effort in about 18 months.

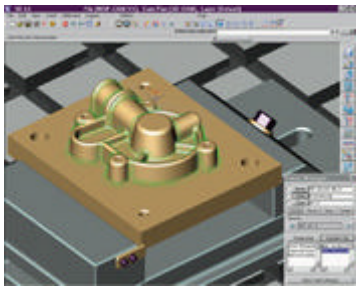
The majority of 3D data today is created in CAD applications, which is why the working group is initially concentrating its efforts on providing greater access to that kind of graphics information, the spokesperson added.

NI Puts LabVIEW on Tektronix Oscilloscopes

Beginning this month, **Tektronix** (Beaverton, OR; website) Open Windows oscilloscopes will include ready-to-run applications of ***LabVIEW***, from National Instruments (Austin, TX; website) as well as a fully functional evaluation version of the software. Pre-built sample

programs will also help users quickly develop their own custom solutions, an NI spokesman said.
By using the LabVIEW-enabled scopes, engineers and scientists will be able to customize their test and measurement applications in industries ranging from consumer electronics to biomedical research, the spokesman noted.
People can purchase the LabVIEW full development system, including the specialized oscilloscope examples, directly from NI.

VX Adding New Milling Tools, Moldmaking Assistant to 6.5



With the next release of ***VX CAD/CAM*, VX Corp.** (Palm Bay, FL; website) will beef up the program's manufacturing tools. Version 6.5 will include the VX Quick Milling suite, which the company describes as "five-axis milling to handle more complex manufacturing situations." A spokesman said users will see speed and toolpath improvements for tool and die machining applications. A complete range of material handling and cutting techniques is supported to allow very complex milling in 3D, he added, such as when working with components that have steep walls or when a part needs to be progressively milled with a variety of tools.
The company will demonstrate the new version at the International Manufacturing Technology Show, this month in Chicago.

A Different Kind of Simulation

All of us who've been around personal computers since back in the day have a fondness for Microsoft Flight Simulator; the program was a great way to relax after playing around with Fortran code all day, and it was actually quite sophisticated for its time. (Kids, this is pre-Windows history.)
But if you're more of a boat guy than a plane guy, here's the software for you. ***DynaSim***, from **DynaFlow Inc**. (Jessup, MD; website), is a Windows-based ship-maneuvering simulator. The user mans the rudder, engine, and lateral thrusters with the mouse and onscreen controls, while the program takes care of modeling waves, wind, and forces such as those caused by other ships and piers. The program actually has a serious use: to help understand and predict the motion of a particular ship being designed.

The Probability of Quality

We hear a lot these days about designing quality into products. But if everyone is focusing on quality, how come we see reports that the

automotive industry, for example, recalls more cars than it makes in any given year? Can we be looking at quality and testing for it in the wrong way? Dr. Andreas Vlahinos, principal at Advanced Engineering Solutions LLC (Castle Rock, CO; www.aes.nu), a product development consulting company, believes that engineers place too much emphasis on “deterministic” computer-aided engineering methods. “Products that test well for a single situation in finite element analysis [FEA] may not perform well in others," he told me. “The problem with relying on FEA is that people have been taught that every problem has only one solution—simply because the techniques they use ignore variation.”

People expect absolutes, and they’ve been brainwashed by educators to forget that variation is everywhere—in material properties, dimensions, loadings, and degradation over time. Just think of material properties. The data used to perform FEA comes from testing coupons or samples of material, and then accepting the average of all variations as the material’s properties. “But no single piece of material will match that data exactly,” Vlahinos says. “They’ve always known this on the manufacturing side, which is why manufacturing drawings always stipulate acceptable tolerance variations.”

The only way to design quality into products is to account for variation, Vlahinos says. He points out two ways to do that: Assuming they have a lot of time and don’t have to get a product to market, engineers can do many, many, many deterministic FEA runs with varied values. Alternatively, they can use an automated statistical approach, known as probabilistic simulation (see the feature story in next month’s Desktop Engineering).

The first commercial probabilistic engineering simulation software came from Ansys (Canonsburg, PA; ansys.com) a couple of years ago. Vlahinos uses it. “This approach lets you specify the mean value of variation, such as wall thickness,” he says. “For example, if the nominal value of the wall thickness of a product is 4mm, you can enter that as the mean value, with plus or minus 0.1mm variation, and get a result that simulates the real, rather than ideal, product.”

Long term, this means that instead of applying factors of safety to worst-case scenarios in deterministic analysis, design engineers can optimize products for performance and quality. “Engineers need to learn to think in terms of how much tolerance variation is necessary to avoid breakage,” Vlahinos says. “Probabilistic simulation isn’t the answer for every situation, clearly, but because variation is part of reality everywhere, it will help us engineer quality into designs.”

Louise Elliott *is a contributing editor for Desktop Engineering.*

INFO. Web Site

CAD/CAM IN THE FIELD:
The Army's Mobile Parts Hospital

“Hey Hawkeye, give me a hand with this tie-rod”

Any Army mechanic worth his or her beans can replace, say, a tie-rod end, but what can they do when no replacement parts are available? That’s where the Army’s Mobile Parts Hospital comes in, custom-milling parts onsite, on demand. The MPH takes inspiration from the Army’s own MASH (Mobile Army Surgical Hospital) units, placing the machinist much closer to the battlefield, or construction site, or wherever parts for wheeled and tracked vehicles may be needed.

Phase I of MPH was housed in a 53ft semi trailer, equipped with a Hawk 3D CMM scanner for scanning parts, a DTM Sinterstation 2500+ laser sintering machine for rapid prototyping, and a Cincinnati Machine Arrow VMC-500 milling center for spitting out replacements.

In Phase II, now underway, the gear is stowed and transported in shipping containers, measuring 8ft x 8ft and 20ft long but expandable (see photos). One container is the rapid manufacturing module, which includes an Optomec laser machine for building parts out of metal powder, layer by layer. The other container, the lathe module, includes a five-axis milling machine. Pro/E and Unigraphics are used for modeling new parts, and it’s all managed with PTC’s Windchill software. An engineering workstation and various bits of hardware and software (including programs for working with STL files) round out the toolkit.

The MPH’s ability to reverse-engineer parts is a necessity for the Army, as it often doesn’t own the engineering data to the parts it uses, and parts for older equipment may no longer be available, not to mention the difficulties of delivering parts to soldiers in the field, or mountains, or desert. Part of the process right now is to build up the database of engineering data, Todd Richman, program manager, told Desktop Engineering.

The containers are equipped with a satellite link, allowing users in the field to download CAD files, when they exist. In the event a permanent part can’t be manufactured onsite, the MPH can link to one of three “Agile Manufacturing Cells” located strategically across the United States: essentially small, dedicated factories capable of building a wider range of parts using a wider range of materials and methods. The Army plans to fully implement the MPH “in fiscal year ’08,” Richman said.

DE contributing editor **Mark Clarkson** *is the author of “BattleBots: The Official Guide.”*

briefly….

EDS (website) says the new version of ***Teamcenter Aerospace and Defense software*** improves accessibility to product lifecycle data on the Net. The new 2.0 comes with a new Web browser interface (Java 2-based) that a spokesman said will allow “a much broader audience” to access and use the system.

Will there be a Macintosh version of **PTC’s *Pro/Desktop***? In an FAQ on its Web site (website), the company asks for “any input which contributes to the business case” of porting the low-cost CAD package to Mac OS X. PTC has already announced it will support a Linux version of Wildfire, the soon-to-be-released version of Pro/E.

GiveMePower (website) and **Advantech Automation Corp**. (website), a manufacturer of industrial computers, will jointly distribute GiveMePower's ***PowerCAD CE*** mobile CAD software on Advantech's new ***MobiPanel*** wireless Web tablet. The MobiPanel features an Intel StrongArm 206MHz CPU with 128MB SDRAM and 32MB flash ROM, Windows CE 3.0, and a 10.4” 800 x 600 TFT LCD screen in magnesium housing.

Stratasys (website) has installed its 2000th rapid prototyping system, the company reports. (To put that in perspective: Since 1988, according to the **Wohlers Report 2002**, 8000 RP machines have been put to work.) **Toro Inc.** recently installed a ***Stratasys FDM Titan***, which builds prototypes from polycarbonate and polyphenylsulfone, as well as ABS plastic.

SmarTeam Corp. (website) has added native BOM (bill of materials) viewing, editing, and comparison to its eponymous product management system.

Dassault Systemes (website) and **Nvidia** (website) have collaborated to improve the graphics in ***CATIA V5*** and ***Enovia Portal*** products. By integrating Nvidia programmable graphics technologies, the programs now simulate real-world lighting conditions more accurately, and shaded models look better, the two companies said. Users will need a Quadro board to take advantage of the finer rendering capabilities, at least until more developers start implementing Nvidia’s Cg high-level shading language.

Board engineers working with ever-faster electrical signals know that things aren’t getting any easier. A new white paper, ***“Printed Circuit Design Challenges at 1Gbps and Beyond,”*** might help. It addresses the implications of high signaling rates for PCB design, with special focus on analysis, simulation, and layout challenges. The paper was produced by **SiQual**, an interconnect engineering consulting firm based in Portland, OR, and is available for free at www.siqual.com/publications/index.html.

We can't remember the last time we saw "CAD drawings" on the list of most popular Internet search terms, but according to a new survey of 4000 design engineers, 48% of them rate online CAD drawings as having a "very significant" impact on productivity. The survey was conducted by Thomas Register (ThomasRegister.com).