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# CAROCPP Market Watch

A Trends & Forecasting Report

**“CAROCPP is Mission Driven - Market Smart!”**

**Bionic Contact Lenses**

*Health Science and Medical Technology and Engineering and Design Industry Sectors*

Just when you thought the six million dollar man was merely pulp fiction, scientists are discovering promising ways to engineer contact lenses filled with electronics. In other words, bionic contact lenses. The word “bionic” was coined by Jack E. Steele in 1958, possibly originating from the Greek word “βίον,” meaning “unit of life” and the suffix -ic, meaning “like” or hence “like life.” Other sources explain the word as being formed from “biology” and “electronics.”

Examples of bionics in engineering include the hulls of boats which imitate the thick skin of dolphins; and sonar, radar, and medical ultrasound imaging which mimics the echolocation of bats. In the field of computer science, the study of bionics has produced artificial neurons, artificial neural networks, and swarm

intelligence. In medicine, bionics means the replacement or enhancement of organs or other body parts by mechanical versions. Bionic implants differ from mere prostheses by mimicking the original function very closely, or even surpassing it.

The field and study of bionics is growing. According to Assistant Professor Babak Parviz, from the University of Washington, much of the micro technology needed to supercharge contact lenses now exists. So far, he and his team have demonstrated that electronic circuits can be assembled in a contact that has been used safely in animal trials. In his studies, they have fitted a lens to a rabbit’s eye, but have yet to power up the lens. Parviz sees broad potential for the bionic lens. “We see the eye not only as

our window to the outside world, but actually a window into the body also.” He notes that many biomarkers can be detected in the eye and believes if the lens can detect specific molecules of interest and relay information, then it can assist in the monitoring of a person’s health. The ability to have continuous health monitoring could be advantageous for individuals who suffer from diseases such as diabetes. They could get an instant warning when their blood sugars go too high or low. The need for blood samples and the expenses associated with obtaining those samples could potentially be reduced.

*Continued on page 4*

**Gaming Shines in Tough Market**

*Arts, Media, and Entertainment Industry Sector*

Although most other media consumption -- movie tickets, CDs, network TV watching -- is down or flat, time spent playing video games has increased about 12%.

According to Mike Griffith, president and CEO of Activision, publisher of games such as Guitar Hero and Call of Duty, video games will eclipse all other forms of entertainment in the decade ahead.

"Guitar Hero is a game but it's also music and a new way of entertainment is being shaped," he said. "We all have an inner rock star waiting to be released. This is Guitar Hero's secret."



*Continued on page 4*

**Inside this issue:**

Biofuel Takes Off	2
Automotive Parts Go Green	2
Life Hacking	3
Adding Another Dimension	3



## Biofuel Takes Off

*Hospitality, Tourism and Recreation, Transportation Industry Sectors*

Continental Airlines on Wednesday became the first U.S. commercial carrier to conduct a demonstration flight powered in part by alternative fuels.

The Houston-based company, the nation's fourth-largest airline, made the flight with a Boeing 737. The flight took about 1 hour, 45 minutes and had no passengers.

Continental chairman and chief executive, Larry Kellner, said the goal was to analyze technical aspects of using biofuels, including effects on the plane's mechanical systems. In this case, the alternative fuel was derived from algae and jatropha, a bush with round, plum-like fruit that's found in parts of South America, Africa and Asia. The test fuel was used in only one of the plane's two engines.

Airlines have been experimenting with alternative fuels as a way to reduce carbon dioxide emissions and lower fuel bills. Jatropha and algae are both considered sustainable, second-generation biofuels, which typically use a wider range of plants and release fewer emissions than traditional biofuels like ethanol.

Continental said its flight was the first to use algae as a fuel source, and the first test involving a two-engine aircraft. One engine ran on a mixture of one-half biofuel and one-half traditional jet fuel. The other ran solely on jet fuel.

The biofuel exceeded specifications for regular jet fuel, and no modifications to the plane or its engines were needed. Kellner and others acknowledged it will likely be several years, a decade perhaps, before biofuels make up a significant percentage of the fuel used by Continental and other major carriers. At present, adequate supplies — and the facilities to make them — simply aren't available.

"The challenge will be to produce it in an efficient way in the quantities we need," Kellner said.

Some experts predict that as production ramps up in the next few years, biofuel could amount to 3% to 5% of the fuel used by big airlines by 2012. By 2020, the level could grow to as much as 20%.

Popular Science  
January 08, 2009



## Automotive Parts Go Green

*Engineering and Design, Manufacturing and Product Development, Transportation Industry Sectors*

Researchers are not only looking at alternative fuels for operating today's motor vehicles, but they are also looking at the myriad of materials used in automotive parts and developing green, renewable alternatives. Researchers at Baylor University in Texas are manufacturing car parts out of coconuts. Examples of car parts made from coconuts include trunk liners, floorboards, and car-door interior covers.

These products replace the synthetic polyester fibers that are typically used in the composite materials for those parts. Scientists are excited about the coconut's potential as it is a renewable resource found in abundance in all countries located near the equator and throughout the tropics. The top five coconut-growing nations in the world are the Philippines, Indonesia, India, Brazil and Thailand.

Uses for the outer husks of the seed of the coconut palm tree are being explored. Typically, the outer husks are discarded, burned, or thrown away in order to get to the seed and the edible food products contained within. In Ghana, for example, it is common to see the husks pile up in mounds. In tropical climates, this practice can exacerbate outbreaks of malaria as water collects in the husks where malaria-

causing mosquitoes can breed. "We are trying to turn trash into cash to help poor coconut farmers" says Walter Bradley, an engineering professor who is leading the project. Bradley hopes that the more complete use of the coconut will increase the demand for coconuts and thereby raise their market value and price. Currently, he estimates that there are about 11 million coconut farmers in the world who make an average income of \$500 per year off of their coconuts.

Coconuts husks are a unique product. The husks are quite large and fibrous and contain a substance known as coconut dust, or piph. The piph starts out spongy, but when it dries, it contracts into dirt-like particles that the Baylor team has confirmed to have the capacity to absorb 10 times its weight in water. "The fiber has very good strength, stiffness and ductility, and potentially can be used for all kinds of things" Bradley said, including a more environmentally friendly type of particle board that would not require toxic binding glues and ingredients.

*Continued on page 4*

ROCP IS THE HEART OF CTE

## Life Hacking: Doing More With Less

*All Industry Sector*

Doing more with fewer resources (time, personnel, financial) is rapidly becoming a common business mantra in today's economic climate. To tame the overload of e-mails, meetings and other, often nagging, tasks, office workers are turning to new organizational techniques to increase their productivity. These techniques are becoming a vital and essential set of employment survival skills.

As with all other aspects of the world of work, computer technology is having an impact. Today's new spin on efficiency or productivity improvement is known as "life-hacking." The term "life-hacking" is derived from pieces of code used by computer programmers to automate an arduous process. In recent years, the term has grown to include any kind of trick that makes life easier. Life-hacking emphasizes technology and encourages the use of gadgets and software.

Adam Pash, a senior editor for the productivity blog, *Lifehacker* offers tips for anything from software shortcuts to improving posture. *Lifehacker* is part of the Gawker Media Network, and Pash's audi-

ence is excited about productivity the way other people get animated about sports or politics. A great example of life-hacking is setting up a system for automatic bill paying. Recommended life-hacking tips and tools include:

- "Remember the Milk," an on-line tool for staying abreast and tracking tasks - Breaking down big ideas into little to-dos is a cornerstone of smart productivity
- "Joe's Goals," another on-line resource, is a minimalist's product that makes goal tracking fun and flexible on a daily basis
- Schedule your goals inside your high energy times of the day
- Use S.M.A.R.T. guidelines to shape your goals: Specific ("run 2 miles, three times a week"); Measurable ("improve my mile times by 25%"); Achievable (avoid pie-in-the-sky goals that you can't expect to achieve.); Realistic (give yourself the time necessary to achieve the goal. Don't expect overnight success.) Timely (have a real deadline with progress check-ups; get your first 5K under your belt by Sept. 1, instead of "run a long race this year"). A more thorough schooling on S.M.A.R.T. is

offered by Robert Bogue at TechRepublic.

• Use "advanced calendar tweeking" strategies that are available through many multi-calendar webapps and desktop tools such as Google Calendar.

Some suggest that life-hacking resembles a repackaged return of the self-help movement of the 1970s, when productivity concepts included things such as writing down thoughts on index cards and keeping them organized with a binder clip or rubber band. Regardless of the decade, the goal remains the same, improve productivity; or work smarter, letting mindfulness become your ultimate life-hack. To learn more strategies for professional and personal life-hacking, visit [Lifehacker.com](http://Lifehacker.com).

*Wall Street Journal*  
December 09, 2008

## Adding Another Dimension

*Arts, Media and Entertainment Sectors*

Three years ago, Jeffrey Katzenberg, one of the most powerful men in Hollywood, had a "Eureka!" moment while watching Robert Zemeckis's "The Polar Express." What made the viewing truly memorable for Katzenberg was that he was watching it in 3-D in an IMAX theater. For the CEO of DreamWorks Animation, the experience was a revelation. "I've seen the future of cinema, and it is 3-D," he said. "

But this is not the 3-D of the Eisenhower era. Back in the 1950s, two cameras captured two separate images and then superimposed them to create an illusion of depth. This stereoscopic imaging often strained viewers' eyes, causing headaches and nausea, and it never really took off.

The rise of digital technology has changed all that; a digital projector can now create a three-dimensional picture by sending two images—one for the left eye and one for the right—eliminating eyestrain as well as the blurred lines that marred many earlier 3-D experiences. Instead of goofy cardboard red-and-blue glasses, viewers wear sleek, fashionably tinted specs to keep their

focus.

Katzenberg believes the improved technology could be the third revolution for his industry, similar to the introduction of sound in the 1920s and color in the 1930s. Indeed, Dream Works Animation has announced that all future films will be shot in 3-D, beginning with "Monsters vs. Aliens," a spoof of a 1950s science-fiction movie scheduled for release in March.

At a time when the movie industry is trying to meet growing audience demand for fresh experiences and new media, many Hollywood bigwigs believe 3-D films could bring back some magic to the silver screen, re-energizing moviegoers and increasing profits. "The key to a good film has always been story, story, story; but in today's environment, it's story, story, story and 'Blow me away.'"

The technology also offers a solution to one of the industry's biggest problems: piracy. About 90 percent of pirated movies come from a camera brought in to a movie theater, and no camera can yet capture a 3-D film.

So far there are only about 1,400 3-D ready screens—including IMAX theaters—in the United States and another 700 around the world.

Yet it's only a matter of time before 3-D technology is so prevalent that it's even available at home. Companies like Samsung and Mitsubishi have started rolling out "3-D ready" TV sets, which refresh images at high speed and use either rear-projection models or plasma TVs. "Glasses-free" sets by Philips—which operate like a holographic greeting card—are in development. DreamWorks Animation and PepsiCo will each air 3-D spots in the Feb. 1 Super Bowl as part of a joint initiative that includes distributing 125 million pairs of special 3-D glasses to American households. Although it will likely take years before the technology can achieve its full potential, those who have invested in a 3-D future are gambling that it's no trick of the eye.

*Newsweek*, January 2009

## Trends & Forecasting

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## Automotive Parts Go Green

*continued from page 2*



Husk fibers are blended with polypropylene fibers then compression molded into the required shapes for automotive parts. The results are a lightweight, yet stiff composite.

The preliminary results from testing show that the coconut composites can meet the specifications for industrial tests, and the mechanical integrity for automotive parts. In fact, test shows that some of the properties of the coconut fibers are superior to synthetic and polyester fibers. Other benefits of this unique renewable resource are that coconut husk fibers don't burn well, or give off toxic fumes, unlike many other synthetic products. The team from Baylor is in talks with a Texas based fiber processing company and continuing their work with safety performance and certification testing. If your next car smells like a Coconut Almond Joy or a Mounds Bar, you could be driving coconut fibers!

www.liveScience.com  
January 06, 2009

## Bionic Contact Lenses

*continued from page 1*

Engineers are exploring the use of coils to harvest radio frequency energy as a possible source to power the electronics. Unlike fictional counterparts that are somehow hardwired into the body, Parviz and his team of researchers envision some sort of wireless communication between the contacts and a control device. Additional work and research is underway. Parviz's project is partially funded by the National Science Foundation.

www.sciencentral.com  
December 09, 2008



## Gaming Shines in Tough Market

*continued from page 1*



Gaming is already affecting the success of other products. Sales of actual guitars and music instruments are getting a boost from music-based games. Guitar Center stores report a 27% increase in sales during the past holiday season. Company executives attributed that to interest in video games.

Artists with songs in Guitar Hero games have seen download sales rise from 18% to 843%. As a result, music companies have begun to leverage video games to increase sales in other areas. At the recent Consumer Electronics Show in Las Vegas, the Neversoft development team took the stage to debut *Fuel*, a song from the upcoming Guitar Hero Metallica, due out in the first half of this year.

USA Today, January 10, 2009