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GeckoSystems Improves Mobile Robot Solutions in New R&D Facility

CONYERS, GA--(Marketwire - May 31, 2011) - GeckoSystems Intl. Corp, a dynamic leader in the emerging mobile robotics industry revolutionizing their development and usage with "Mobile Robot Solutions for Safety, Security and Service™," (PINKSHEETS: [GOSY](http://www.geckosystems.com/)) (<http://www.geckosystems.com/>) -- announced today they have improved one of their mobile robot solutions, the GeckoMotorController™ 7.2, due to better testing at their new R&D facility.

"Recently we announced that we expected our new R&D lab to be more appropriate for our needs to continue our advanced mobile robot solutions work. After early 'level of autonomy' testing in our new facility, we learned that our GeckoMotorController (that was recently upgraded this past year to its seventh generation) to have need of further improvements," commented Martin Spencer, President/CEO, GeckoSystems Intl. Corp.

The new GeckoMotorController continues to use a proprietary "self adaptive" constant energy paradigm for extraordinarily smooth acceleration and de-acceleration of their mobile service robots. A 'herky jerky' mobile robot platform can be very distracting when proximate to people and other living creatures. "Our latest upgrade to this fundamental low-level software continues to enable ballet smooth movement, but with more robust ramping algorithms from a dead stop," reflected Kevin O'Connor, Sr. EE Robotist, GeckoSystems Intl. Corp.

The GeckoMotorController is written in the software programming language known as "C," uses quadrature encoded PWM and runs one of the two CPUs that are subsystems on the GeckoSPIO™.

"I continue to be very pleased with our new facility. We have a much better testing environment, more amenities, and less noise. I am looking forward to the engineers and programmers we are presently interviewing joining us in this new space, which is more conducive to our advanced robotic systems development," stated O'Connor.

At this new facility, GeckoSystems will be continuing its R&D into advancing their suite of proprietary mobile robot solutions for not only the upgrading of wheelchairs to be collision proof, but also the recently announced GeckoImager™, the AscBot™, and the ChairBot™.

GeckoSystems' new GeckoImager uses sensor fusion interpolated with structured

light machine vision ("depth camera") data from the Kinect sensor with sonar range finding data, complimented by GeckoOrient's™ solid-state compass, accelerometer, and odometry sensor fusion. This provides their automatic, self-navigation AI software, GeckoNav™, with sufficient and timely data to achieve actionable situation awareness resulting in a very safe, loose crowd level of mobile robot autonomy that is "collision proof."

This unedited video, <http://www.youtube.com/watch?v=kn93BS44Das> , shows a GeckoSystems' CareBot™, equipped with a pair of Microsoft Kinect sensors, navigating through a narrow passageway cluttered with various obstacles. This represents the worst case for in-home and/or commercial navigation. GeckoSystems recently announced GeckoImager™ incorporates multiple Kinects for a sufficient field of view (FOV) to be safe, collision proof, and capable of automatic self-navigation.

"As demonstrated in the video, the CareBot's automatic self-navigation is accomplished using three high level GeckoSystems' AI savants: GeckoImager, GeckoNav and GeckoSuper. The three savants are spread over two low cost, low power, off-the-shelf dual core Intel Atom motherboards running at 1.66 GHz located on the robot. The computer running GeckoImager is running Ubuntu Linux 10.10 while the computer running GeckoNav and GeckoSuper is running Microsoft Windows XP. Two low-level GeckoSavants, GeckoOrient™ and GeckoMotorController™ run on their robot controller board, the GeckoSPIO. All of the capabilities depicted in this video are running on board on this prototype mobile service robot. I am very pleased to be part of the engineering and programming team that achieved this demonstrable accomplishment," stated O'Connor.

This fundamental technological approach has many applications in mobile service robots. Heretofore, cost, size and complexity of set up has been prohibitive. Microsoft's recent contribution to the advancement of low cost, truly utilitarian personal robots advances their founder's timeline notably and takes their new product, the Kinect, far beyond only the living room.

Service robots can be used to provide domestic aid for the elderly and disabled, serving various functions ranging from cleaning to entertainment to remote monitoring. The high cost of labor in developed countries and the increasing need for assisted living has led to the development of the service robotics market. As service robots are in greater proximity to humans, the technology involves more safety concerns over human-machine interaction. However, developments in the manufacture of intelligent and safer robots by GeckoSystems address the issues of safety, manipulation, and sensing. Thus, GeckoSystems is well prepared for the day when every home will have a robot.

A test drive in a house was not done as the first demo since most homes are not as cluttered as the "gauntlet alley" depicted. An actual home video, using the prior CompoundedSensorArray™ is at: <http://www.geckosystems.com/>

The design strategy for incorporating the Kinect units into the CareBot overall shroud design is to keep integration costs and manufacturing costs at a minimum. Just as the Ford Model A was better than that of the Model T, nonetheless several millions of Model T's were sold due to the compelling value proposition of selling for the same money as a motorcycle, but capable of carrying up to four people in a near weatherproof transport.

GeckoSystems has several breakthrough technologies -- not just the GeckoImager -- in concert with the Kinect, and all the other necessary mobile robot solutions, such as their GeckoSavants, to have a complete, cost effective and multifunctional product. Due to the robustness of GeckoSystems' biological hierarchal architecture, GeckoNav, being "sensor loving," and the recent invention of GeckoImager, the company has strengthened its "first mover" position in this emerging trillion-dollar industry.

Further, scanning laser range finders provide a similar level of data flood as does the Kinect. Robot experimenters have used scanning laser range finders for nearly ten years. At a cost of \$2,500 to \$50,000 each they are prohibitive. The PrimeSense Kinect solution is a watershed event due to its low cost and extremely robust functionality. It is consumer pricing for an industrial solution that has been investigated and improved for over 30 years.

GeckoSystems' successful adaptation of Microsoft's Kinect with the GeckoImager enables more markets to be addressed in addition to wheelchairs, such as retail. The strategic business need addressed by GeckoSystems' AscBot is to enhance the in store shopper's experience to strategically position the retailer as better, different than their competitors. This will enable them to enjoy margins greater than their competitors while maintaining desired market share. This type of strategic marketing positioning is necessary to increase gross sales while reducing overall operational costs to increase net profits. Simultaneously, while increasing sales with in store assistance and product promotions, the AscBot's mobile and intelligent video surveillance systems would dramatically reduce shrinkage due to internal and external theft. Simply stated, GeckoSystems' AscBot would "inform and observe™" in retail stores.

The development of the AscBot will make extensive use of existing GeckoSystems technologies originally developed for the CareBot. While the AscBot will require a superset of the existing GeckoSystems capabilities, the additional functions required by the AscBot are currently available in off-the-shelf products that can be easily integrated into the existing GeckoSavant™ architecture.

GeckoSystems' successful adaptation of Microsoft's Kinect with the GeckoImager enables more markets to be addressed in addition to retail stores, such as healthcare cost reduction with the recently announced ChairBot™.

Care for infirm, chronically ill, and frail individuals with various potentially life threatening episodes is a significant problem throughout the world. The national and international shortage of qualified doctors, nurses and other appropriate health care professionals is well documented in numerous publications and research studies. Tech enabling caregivers is a 21st century solution to this century old problem of cost effective family and societal healthcare.

GeckoSystems has been developing eldercare capable personal robots, the CareBot, for nearly 14 years. Recently they completed their first year of in home trials with many insightful and unexpected benefits to not only the care receiver, but also the extended care giving family. Given this experience, they believe that an eldercare capable robotic wheelchair upgrade could cost effectively assist those infirm family members that are not typically able to walk about freely, needing routine vital sign monitoring and immediate notification of appropriate care givers when vital sign limits are triggered. This group represents family members requiring nearly constant monitoring.

This robotic wheelchair, or ChairBot, would consist of a wheelchair equipped with several artificial intelligence systems (GeckoSavants) developed for the CareBot. In concert these systems enable the occupant of the chair to benefit from automatic collision avoidance and room-to-room transitions. GeckoChat™ would provide verbal interaction for control of the wheelchair and annunciate medication and other timely reminders. The GeckoScheduler™ would time and commence the prompting of the various reminders for medication and/or vital sign measurements such as blood pressure, pulse rate, blood sugar and/or oxygenation level, EKG monitoring, etc. mounted on the wheelchair. The GeckoSuper™ would be programmed by the care givers such that appropriate alarms would trigger should any pre-set vital sign parameters be exceeded and pre-designated parties promptly notified by pager, email, and/or cell phone. In nursing homes or assisted living facilities each ChairBot would be wirelessly networked into the residence's IS system for continuous monitoring of each individual's vital signs as they went about their daily routines.

While the cost of the ChairBot would be greater than that of a CareBot, the cost benefit ratio would be even more extraordinary since semi-professional and professional care givers would no longer be required to be in near constant physical proximity of the care receiver. Hence one caregiver could provide complete monitoring of multiple patients and yet be immediately notified if any of their vital signs exceeded pre-established bounds.

"We continue to be very pleased with our new R&D facilities. We are interviewing and hiring more engineers and programmers to continue our product development on the CareBot, the upgrading of wheelchairs to be 'collision proof,' and our new AscBot and ChairBot product concepts. This friendlier, non-intimidating movement of our mobile robots will further speed the adoption of them by the consumer, professional healthcare, and commercial/homeland security marketplaces, while providing our nearly 1400 shareholders the ROI they deserve for their vision and confidence in GeckoSystems," concluded Spencer.

About the Company:

Since 1997, GeckoSystems has developed a comprehensive, coherent, and sufficient suite of hardware and software inventions to enable a new type of home appliance (a personal companion robot) the CareBot™, to be created for the mass consumer marketplace. The suite of primary inventions includes: GeckoNav™, GeckoChat™ and GeckoTrak™.

The primary market for this product is the family for use in eldercare, care for the chronically ill, and childcare. The primary distribution channel for this new home appliance is the thousands of independent personal computer retailers in the U.S. The manufacturing infrastructure for this new product category of mobile service robots is essentially the same as the personal computer industry. Several outside contract manufacturers have been identified and qualified their ability to produce up to 1,000 CareBots per month within four to six months.

The Company is market driven. At the time of founding, nearly 14 years ago, the Company did extensive primary market research to determine the demographic profile of the early adopters of the then proposed product line. Subsequent to, and based on that original market research, they have assembled numerous focus groups to evaluate the fit of the CareBot personal robot into the participant's lives and their expected usage. The Company has also frequently employed the Delphi market research methodology by contacting and interviewing senior executives, practitioners, and researchers knowledgeable in the area of elder care. Using this factual basis of internally performed primary and secondary market research, and third party research is the statistical substance for the Company's sales forecasts.

Not surprisingly the scientific statistical analyses applied revealed that elderly over sixty-five living alone in metropolitan areas with broadband Internet available and sufficient household incomes to support the increased costs were identified as those most likely to adopt initially. Due to the high cost of assisted living, nursing homes, etc. the payback for a CareBot is expected to be only six to eight months while keeping elderly care receivers independent, in their own long time homes, and living longer due to the comfort and safety of more frequent attention from their loved ones.

The Company's "mobile robot solutions for safety, security and service™" are appropriate not only for the consumer, but also professional healthcare, commercial security and defense markets. Professional healthcare require cost effective, timely errand running, portable telemedicine, etc. Homeland Security requires cost effective mobile robots to patrol and monitor public venues for weapons and WMD detection. Military users desire the elimination of the "man in the loop" to enable unmanned ground and air vehicles to not require constant human control and/or intervention.

The Company's business model is very much like that of an automobile manufacturer. Due to the final assembly, test, and shipping being done based on geographic and logistic realities; strategic business-to-business relationships can range from private labeling to joint manufacturing and distribution to licensing only.

Several dozen patent opportunities exist for the Company due to the many innovative and cost effective breakthroughs embodied not only in GeckoNav, GeckoChat, and GeckoTrak, but also in additional, secondary systems that include: GeckoOrient™, GeckoMotorController™, the GeckoTactileShroud™, the GeckoImager™, and the GeckoSPIO™.

What Does a CareBot Do for the Care Giver?

The short answer is that it decreases the difficulty and stress for the caregiver that needs to watch over Grandma, Mom, or other family members most, if not much, of the time day in and day out due to concerns about their well being, safety, and security.

But, first let's look at some other labor saving, automatic home appliances most of us use routinely. For example, needing to do two or more necessary chores and/or activities at the same time, like laundering clothes and preparing supper.

The automatic washing machine needs no human intervention after the dirty clothes are placed in the washer, the laundry powder poured in, and the desired wash cycle set. Then, this labor saving appliance runs automatically until the washed clothes are ready to be placed in another labor saving home appliance, the automatic clothes dryer. While the clothes are being washed and/or dried, the caregiver prepares supper using several time saving home appliances like the microwave oven, "crock" pot, blender, and conventional stove, with possible convection oven capabilities.

After supper, the dirty pots, pans, and dishes are placed in the automatic dishwasher to be washed and dried while the family retires to the den to watch TV, and/or the kids to do homework. Later, perhaps after the kids have gone to bed, the caregiver may then have the time to fold, sort, and put up the now

freshly laundered clothes.

So what does a CareBot do for the caregiver? It is a new type of labor saving, time management automatic home appliance.

For example, the care giver frequently feels time stress when they need to go shopping for 2 or 3 hours, and are uncomfortable when they have to be away for more than an hour or so. Time stress is much worse for the caregiver with a frail elderly parent that must be reminded to take medications at certain times of the day. How can the caregiver be away for 3-4 hours when Grandma must take her prescribed medication every 2 or 3 hours? If the caregiver is trapped in traffic for an hour or two beyond the 2 or 3 they expected to be gone, this "time stress" can be very difficult for the caregiver to moderate.

Not infrequently, the primary caregiver has a 24 hour, 7 days a week responsibility. After weeks and weeks of this sometimes tedious, if not onerous routine, how does the caregiver get a "day off?" To bring in an outsider is expensive (easily \$75-125 per day for just 8 hours) and there is the concern that medication will be missed or the care receiver have an accident requiring immediate assistance by the caregiver, or someone they must designate. And the care receiver may be very resistant to a "stranger" coming in to her home and "running things."

So what is it worth for a care receiver to have an automatic system to help take care of Grandma? Just 3 or 4 days a month "off" on a daylong shopping trip, a visit with friends, or just take in a movie would cost \$225-500 per month. And that scenario assumes that Grandma is willing to be taken care of by a "stranger" during those needed and appropriate days off.

So perhaps, an automatic caregiver, a CareBot, might be pretty handy, and potentially very cost effective from the primary caregiver's perspective.

What Does a CareBot Do for the Care Receiver?

It's a new kind of companion that always stays close to them enabling family and friends to care for them from afar. It tells them jokes, retells family anecdotes, reminds them to take medication, reminds them that family is coming over soon (or not at all), recites Bible verses, plays favorite songs and/or other music. It alerts them when unexpected visitors, or intruders are present. It notifies designated caregivers when a potentially harmful event has occurred, such as a fall, fire in the home, or simply been not found by the CareBot for too long. It responds to calls for help and notifies those that the caregiver determined should be immediately notified when any predetermined adverse event occurs.

The family can customize the personality of the CareBot. The voice's cadence can be fast or slow. The intonation can be breathy, or abrupt. The voice's volume can

range from very loud to very soft. The response phrases from the CareBot for recognized words and phrases can be colloquial and/or unique to the family's own heritage. The personality can range from brassy to timid depending on how the care giver, and others appropriate, chooses it to be.

Generally, the care receiver is pleased at the prospect of family being able to drop in for a "virtual visit" using the onboard webcam and video monitor for at home "video conferencing." The care receiver may feel much more needed and appreciated when their far flung family and friends can "look in" on them anywhere in the world where they can get broadband internet access and simply chat for a bit.

Why is Grandma really interested in a CareBot? She wants to stay in her home, or her family's home, as long as she possibly can. What's that worth? Priceless. Or, an average nursing home is \$5,000 per month for an environment that is too often the beginning of a spiral downward in the care receiver's health. That's probably \$2-3K more per month for them to be placed where they really don't want to be. Financial payback on a CareBot? Less than a year. Emotional payback for the family to have this new automatic care giver? Nearly instantaneous.

Facebook: <http://www.facebook.com/group.php?gid=140182685996116&v=wall>

YouTube: Kinect Enabled Personal Robot video: <http://www.youtube.com/watch?v=kn93BS44Das> In this video one will observe static and dynamic obstacle avoidance into and back out of a cluttered and narrow "gauntlet alley." One may determine that the movements are smoother than what most people could do using a joystick, human controlled mobile platform. One will witness three low levels of obstacle avoidance: reactive, proactive, and contemplative. No prior mapping or path planning was performed before or during the demonstration run. GeckoNav, the AI savant doing the guiding, controls all mobile activities during this demo. You will witness subsumptive AI behaviors occurring as obstacle avoidance subsumes way point seek and vice versa with an emergent behavior expressed as errand running down a cluttered hallway and back without any human intervention.

Elder Care Robot Trial Video 2, Stationary View http://www.youtube.com/watch?v=smUNIs4LJtY&feature=player_embedded#at=16

One CareBot™ One Family http://www.youtube.com/watch?v=xxK46chfP6A&feature=mfu_in_order&list=UL

Mobile Robot Navigates Dining Room & Kitchen http://www.youtube.com/watch?v=S_jd9_0W9mE&feature=mfu_in_order&list=UL

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