Inventor connects to wireless future

By SALI McSHERRY

With the stroke of a key on a smart phone, parents will be able to locate their kids, elderly parents or pets, said Mark J. Heiferling, of Auburn.

One day, people will be able to order a latte from Starbucks from their smart phones and pay for it "wirelessly" through their check cards, and all it takes is a couple of key strokes, he said.

Soon, a cell phone will be able to connect to another cell phone and then to a sensor device and right back to a cell tower in a micro-second or less, he said.

Mr. Heiferling, who has a master's in business administration, is an inventor and entrepreneur and president and founder of Bluetronix Inc. in Chagrin Falls.

"I see an opportunity in how tiny computers will be controlled and wirelessly connected in the future after the way nature and organisms operate now," he said. "Making tiny embedded computers-radios think, learn, route and wirelessly connect ubiquitously with real-time information is Bluetronix's vision, and the next Internet will be in your wallet, built into your jacket, in your car and throughout your house. You won't see it, but it will be all through your life."

All this will happen in 10 years or less with new technologies that bring great commercial applications for pending products, Mr. Heiferling said, and he foresees growth of over 400 percent in the next two years alone.

Taking a cue from the efficiency of an ant colonies and insect biological networks, his company is using "swarm intelligence," which he said is a radical shift from the conventional method of information transmission. It's a bottom-up approach vs. a top-down one, which will better meet communication needs, Mr. Heiferling said.

Armed with almost $2.5 million from the U.S. Department of Defense and NASA and several patents, his firm has a new approach to wireless communications for markets like cellular, industrial, military, energy, home automation and almost all markets needing wireless connectivity, he said.

Over seven years, Bluetronix has developed wireless solutions for using swarm intelligence to provide router-to-router interconnectivity, and its products are used in specific areas such as mobile communications, cellular, wireless sensor networking, autonomous controls, supply chain management, military communications, medical wireless, and many others, he said.

Photo by Itamar Gat

Mark J. Heiferling is president and founder of Bluetronix Inc., which is advancing new technologies from its location in Chagrin Falls.

"Ad-hoc connectivity in mobile environments works on peer-to-peer connectivity. In essence, these impromptu wireless networks make each connection point a router. What makes the swarming and their patents different is that they use no access points or direction," Mr. Heiferling said.

"The advantages of using such a network using mathematical algorithmic equations, specifically biologically inspired algorithms, as a routing approach, which originated with the study of ant colonies, enhances efficiency, increases robustness and scalability," Mr. Heiferling said.

A colony of ants sends foragers to find food sources, and, when those ants return, they lay a trail of pheromones, or chemicals, that enable ants to find food, locate others and, most importantly, organize chaos with simplicity, he said. Therefore, other ants follow the trail, laying their own pheromones, and, while the first forager may not have found the most direct route, others will, he said. Eventually, the most efficient trail becomes dominant with heavier pheromones.

"All of this is done without any direction or control — totally self organizing in nature. Blutronix's patented algorithms instruct all these behaviors in mathematical manner with superb results," Mr. Heiferling said.

That approach applied to the military and businesses can revolutionize wireless communications, he said.

"The company currently is advancing towards transforming these prototypic systems into commercial products consisting of tiny intelligent modular devices that can be utilized in a wide range of applications both commercially and militarily are center around stamp-sized radios with microcomputers that incorporate the company's algorithms and will be foundation products for many markets like energy, instrumentation, medical, home automation, LED lighting, vehicles, asset tracking, product bar codes, location service and emergency communications," Mr. Heiferling said.

As an inventor, he holds several patents, has published many papers and has 25 years of experience in data communications, radios and computer systems and a bachelor's degree in economics from Wittenberg University.

Mr. Heiferling has worked with several technology firms and was selected for the Presidential Small Business Commission award for the State of Ohio from former President George W. Bush in 2006. He also was honored by Kent State University with a technology award in 2007 and in 2009 the Small Business Innovative Research Success Award from the Defense Advanced Research Projects Agency, of the U.S. Defense Department.

"I got tired of hearing folks talk about things all the time and decided to go out on my own," Mr. Heiferling said.

Subsequently, he created three companies and over 57 high-paying jobs in the last 12 years, he said. "The most surprising fact I learned is that we have many great companies right here, and we just have to work together to create great jobs and economic benefit. Like the swarm intelligence, it's all interdependent."

Bluetronix also is involved in providing engineering services for sensor integration and design, global positions systems, wireless consulting and smart phone applications.

On Campus

Daniel Berry, of Auburn, received a bachelor of business administration in finance and marketing during fall commencement at Ohio University. He is a 2006 graduate of Kenston High School.

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Tyler Shea, son of Kimberly Craig, of Chagrin Falls, is a reporter for the student-published newspaper the Collegian at Ashland University. He is a graduate of Chagrin Falls High School.

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Cassandra Collins, of Orange, was named to the dean's list for fall semester at the University of Mount Union in Alliance. The Orange High School graduate is a senior international business, economics and Spanish major.

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Aliya Decates, of Chagrin Falls, was named to the dean's list for fall semester at American International College, Springfield, Mass. She is a junior majoring in physical therapy.