Help wanted: Robots and drones need not apply

One would imagine that a state-of-the-art robotics organization would be housed in a sleek modern building downtown, but Intelligent Robotics is located in a picturesque neighborhood across from a field of cows.

One might also assume that a company comprised of an elite roster of scientists and hardware designers would be found in a big city or a Silicon Valley techie town, but this small group of dedicated professionals is right in our backyard, and they are hoping to expand their research by hiring locally.

Tathagata Mukherjee, CEO and chief scientist at Intelligent Robotics, Inc., is looking for qualified people to hire and he's turned his eye toward the Big Bend area and Gadsden County. The federal nonprofit is fully funded through the Air Force Research Labs.

He is looking for individuals with the needed skills for programming devices such as drones to operate with minimal human interaction

Photos by Tammy Dasher

Tathagata Mukherjee, CEO and chief scientist of Intelligent Robotics Inc., is searching Gadsden County for qualified people to hire for his company.

Intelligent Machines

Mukherjee proudly shows visitors tables laden with bits of electronica as he walks carefully between the drones sitting on the floor like patient dogs awaiting their master's command. His professorial experience shows in his patient teacher's way of explaining the complicated concepts that are his passion.

Using software proficiency to focus on design and development, the nonprofit also puts an emphasis on sharing the knowledge gained through scientific research.

Mukherjee describes their work as "cutting-edge research in the field of Unmanned Aerial Systems."

He explains, "We build systems that are 'intelligent' and can act autonomously. We are one of the few companies in the United States that applies machine learning with SDR (software-defined radio). Our goal is to demonstrate the use of machine intelligence with SDR for assured communication and GPS-free positioning. Our algorithms are targeted at Unmanned Aerial Systems."

Software-defined radio is a radio communication system in which components traditionally implemented in hardware are instead implemented by means of software on a personal computer or other embedded system (your cell phone has one).

The concept of software-defined radio is not new, but the most recent research has the capability of bringing practicality to processes that were once only theoretical.

"We are mostly software people," states Mukherjee.

He discusses how they buy parts, print parts with a 3-D printer, put systems together, and use software-defined radio to work toward their goal of minimizing human interaction in the flying of drones.

Citing common pitfalls of typical GPS systems — dropping the signal or performing poorly in certain rural areas — Mukherjee said their research explores the use of "signals of opportunity," so reliance on GPS is reduced.

This "GPS-denied navigation" is especially useful for military purposes since GPS systems can get jammed or "spoofed," disrupting the reception of the signal.

Flying Robots

Aside from the military uses, software-defined radio can be used to guide drones, which are increasingly being explored as ways to deliver goods directly to consumers' homes.

The autopilot technology is something that could also be used in commercial airlines.

The researchers at Intelligent Robotics, Inc. have showcased their work by driving a car with an antenna to Eglin Air Force Base to prove they could localize from the ground. They have also tested in the air with their drones.

Indicating the drones around the room, Mukherjee points out features of these small "robots," which do indeed spring to life at their masters' command — only their commands are programmed on a keyboard.

Mukherjee mentions that their team includes both "software and hardware people."

"It's like we don't speak the same language sometimes," Mukherjee says.

"We each have a different way of looking at things." Daniel Rodriguez, a 3-D designer and thus, a hardware person, looks up from his wall of computer monitors and grins at this comment, concurring that they share a goal of getting software and hardware to communicate more effectively.

Rodriguez and Mukherjee both laugh when asked if they name their drones, but they are obviously fond of these machines that are the result of their long hours of research and work. Rodriguez's knowledge in the area of hardware is evident as he speaks.

"The drones are very light but need to carry the batteries plus the weight of the computer and sensor system, so they should be able to carry a heavy payload. You have to pick them up and do all these 'yoga moves' with them to sync the system before it can fly," Rodriguez concludes.

Tathagata Mukherjee, CEO and chief scientist of Intelligent Robotics Inc., shows off a software-defined radio sytem used by his company.

Small field=Big opportunity

The community of researchers studying in this field is small — Mukherjee estimates between 600 to 700 people — but he adds, "It's a very, very active community. However, there are lots of problems we run into that no one has faced before. If that happens, there's no one to ask so we have to figure it out for ourselves."

Along with publishing papers on their research and applying for grants and patents, Intelligent Robotics, Inc. also aims to educate others about their work. They hold software-defined radio workshops with nationally-known speakers from their field.

These workshops are open to anyone, but typically participants must have some background knowledge of signals and Unix-based systems. They also host 3-D printing workshops, typically in the summer, where attendees are able to learn how to use 3-D printers.

Their workshops are unique because they actually have 3-D printers, which participants get to use during the workshop. The workshops are free (with the exception of a small cost to cover printing fees for the 3-D printer workshops).

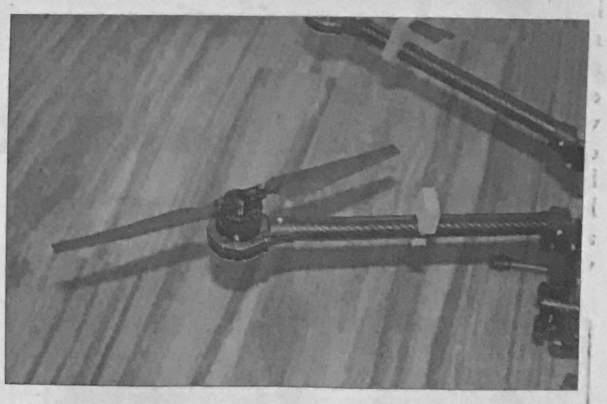
"This nonprofit and contribution to the national defense community is my way of saying thank you to the taxpayers for funding my graduate studies and my research," Mukherjee says with his kind smile.

Mukherjee says it is hard to find people with the requisite skills to hire.

To this end, he is interested in conducting workshops in Gadsden County, both at the high school and for others who may be interested, to spread the word about his organization and to encourage students to explore career options in the computer science field.

"We want people to know what we're doing," Mukherjee concludes. "We would like more visibility."

More information about the company can be found by checking its website at www.intelligentrobotics.org.



Intelligent Robotics Inc. uses drones such as these to test its software-defined radio technology.

CITY OF QUINCY
NOTICE OF PUBLIC HEARING

The Quincy City Commission will hold its meeting on Tuesday, February 13, 2018 at 6:00 PM in the Quincy City Hall, located at 404 W. Jefferson Street, Quincy to conduct a first public hearing on the proposed ordinance entitled:

ORDINANCE NUMBER _____-2018

AN ORDINANCE OF THE CITY OF QUINCY, FLORIDA, AMENDING THE CITY CODE OF ORDINANCES; PROVIDING FOR FINDINGS; PROVIDING FOR AMENDMENT TO CODE OF ORDINANCES CHAPTER 6 TO AMEND THE GRANDFATHERING PERTAINING TO SEPARATION REQUIREMENTS FOR ESTABLISHMENTS SELLING ALCOHOLIC BEVERAGES; PROVIDING FOR SEVERABILITY; PROVIDING FOR COPY ON FILE; AND PROVIDING FOR AN EFFECTIVE DATE.

Interested parties may appear at the City Commission Meeting to be heard with respect to the proposed ordinance. If you have any question, please call Building and Planning Department at 850-618-1885.