Program: Drone Integration into Industry
Speaker: Jim Love, Light Robotics Manager, Becks Hybrids
Attendance: 121
Guests: Susan Keniger, Bob Cowans, Martyn Roberts, Sarah Roberts, Renee Ratermann, Ellen Rosenthal
Scribe: John Peer
Editor: Bill Elliott

Today's presenter was Jim Love, Light Robotics Manager for Beck's Hybrids, (www.beckshybrids.com). Jim has been with Beck's for 30 years. Beck's was started in 1937 and is now the largest family-owned seed company in America. Headquartered in Atlanta, IN, they employ 700 people with facilities throughout the Midwest, but mainly in IN, IL, IA, OH, and KY. They pride themselves on being vertically integrated and do as much of their work in-house as possible. They have maintained family control and stress a family owned culture.

Drone technology, especially in agriculture, is just starting and is expected to grow quickly. For years farmers have used GPS-controlled machinery (plows, planters, combines, etc.). Drones add the capability of precise imaging through a range of camera technologies. The images are uploaded and the data quickly analyzed to then give guidance to the farmers on how to optimize their operations. Planting, drainage, harvesting, etc. can be optimized based on the data from the images taken by the drones. Farmers then can change the density of their planting based on the fertility of the ground within each acre. Now with the advent of multi-hybrid seed planters (can plant two different types of seeds), farmers can further increase their yield by selectively choosing which seed to plant as the planter traverses the acreage, based on drone imagery.

Beck's main business is selling seeds, but they enhance their value by doing research to help farmers improve their operations. This is why they focus on drone technology which they share with their seed customers.

In addition to agriculture, other uses for drone imaging are search and rescue, film making, pipeline surveillance, police & fire, fire reentry, mining, delivery, flying AED, and confined space entry. Agriculture is the 5th largest application for drones, preceded by aerial photography, real estate, aerial survey, and aerial inspection.

Beck's mission for their robotics research is to:
• Evaluate hardware platforms
• Evaluate software
• Discover practical applications

Drone hardware is evolving rapidly. Initially a $25K Ebee foam rubber single engine plane (3 ft wingspan) could image 300 acres in 40 min. Now the Phantom 4 quadcopter which costs $1200 can cover 80 acres in 13 min (about the same productivity).

The drones can use both RGB (natural visible light) cameras and NIR (Near Infrared) cameras. There is software to control the drones in developing flight paths to comprehensively and automatically cover a specified area. A popular service is Drone Deploy. Data Mapper is software (cloud based) that stitches the drone images together into a comprehensive data set and then analyzes the data. Images taken during the day (usually mid-day with the brightest light) can be uploaded to the cloud and the results downloaded by morning. This gives an actionable result for the farmer, which is essential.

Beck's research also does "Drone Shootouts" to compare the competing drone products, as a service to their customers.

Drone technology got off to a slow start due to the lack of standards. Since the FAA has established the UAS (Unmanned Aircraft Systems) Rule (Part 107), the industry has taken off. Part 107 requires drones to be less than 55 lbs., fly within the line of sight, be operated by a Part 107-licensed person, stay out of restricted areas, avoid manned aircraft, and stay under 400 ft.

Jim also promotes drone education and training. He supports educational civic groups, schools, and professional groups. He trains pilots including customers. No prior aviation experience is required.

Jim Love and drone