AMP SoCAL
ADVANCED MANUFACTURING PARTNERSHIP FOR SOUTHERN CALIFORNIA
LED BY THE USC CENTER FOR ECONOMIC DEVELOPMENT

Fac-a-thon Notes

April 7, 2017

The Fac-a-thon, an industry/university research discussion was held on February 10th, 2017 to create dialog between researchers in industry and academia to share current and future research needs in the development of advanced materials and manufacturing processes. Five areas of research were suggested:

1. Research on composite materials, coatings and processes for complex shapes and high production processing volumes
2. Real-time data collection and inspection during automated manufacturing of composites, coatings and binders used in materials
3. Improved materials, coating and inspection to extend the life of machine tools
4. Designing and testing novel materials resistant to decomposition as well as energy storage for batteries, allowing UAVs and other platforms to extend their distance and commercial use
5. Training to existing workers on smart manufacturing, recycling and robotics

On April 7, 2017 a follow-up Fac-a-thon was held to review these areas and other potential areas that industry leaders are interested, facilitated by Marie Talnack. The three specific areas that were discussed were Battery Technology, Composite and Advanced Materials, and Advanced Manufacturing. Notes surrounding research ideas from the discussions follow:

Battery Technology

Gains in battery technology are being undermined by increase power demand and increased resolution on cameras and sensors, etc. The need for more powerful batteries can't keep up with the demands of the evolutions of the cameras. A collaboration between camera/sensor manufacturers and battery manufacturers should be led by university support from both industry and manufacturers. In basic research, application is difficult, especially the tech transfer issue. Tesla has a good model to apply research, although it is a different application it can be used for Nano technology application to batteries. Another, issue was using ultra capacitors (HE/HD) for energy management and in-flight battery swaps.

Composites

Data collection needs to make sure composite materials are high quality and can be manufactured in complex shapes. There is a future in composites utilizing metal matrix vs resins nanotech intro aggregates to create complex forms. Need composites that can withstand extreme temperatures and

extreme changes, and embed sensors into composites during manufacturing process. The semiconductor industry has material science issues on these same platforms. A partnership with Netherlands IMEC, who has an office in San Francisco and integrates electronics in CubeSat's may be beneficial to look into. University of Mexico at Los Alamos researches how to integrate electronics and routed systems within primary and secondary structures in primary and secondary UAV systems and radiation hardened electronics. Additionally, it was brought up that additive manufacturing is cost prohibitive. A solution of interest would be to develop a lighter, stronger material that reduces the weight of the platform with lighter batters that will extend the life of a vehicle in space. Focus on composite manufacturing is fundamental but there is always a trade off on volume and price.

Advanced Manufacturing

Light weight components and the materials should be recyclable. Manufactures would need to be trained in additive, smart and recyclable manufacturing. While the research center would not be conducting training themselves, the research that comes out could lead to the need for industry in-house training. To facilitate the training, they could implement augmented reality as discussed in Industry 4.0. The center could implement a training qualification review board, building standard procedures built out of new processes that are developed. Suggestions to bring in community colleges for workforce training.

In conclusion

Letters of support from industry, including international businesses, are needed to submit the application. You will receive a draft letter of support to personalize and submit.

Universities interested in applying as an alternative site have a separate form that will be sent directly to those interested universities.

If you have contacts at Aero Environment, Unique, General Atomics or any other aerospace and defense manufacturer, please forward them information about this initiative and ask them to submit a letter of support, if interested.