SPACE GRANT RESEARCH PROJECTS 2017

Selected students will be assigned to a research project that best fits their educational experience. Each project will offer the student the opportunity to engage in hands-on research under the supervision of a professional mentor. Potential NC Space Grant/LORD Corporation Summer Internship Program projects are described below:

In-Mold Bonding of Rigid Thermoplastics
This internship is geared towards students majoring in Chemistry, Material Science, or Chemical Engineering. LORD is actively conducting R&D aimed at developing a platform of adhesives for bonding rigid thermoplastics to a variety of metallic and non-metallic substrates during the injection molding process. Adhesives of this type would enable high through-put, low-cost manufacturing in the personal electronic device and automotive markets. The intern will be working with senior scientists, engineers, technologists, and business development staff to rapidly develop protectable technologies as well as prototypes for external customers. Typical activities would include laboratory work, analysis of data, analytical characterization of prototypes, scale up batches, and presenting progress to technical teams.

Software Development
For this assignment, the engineering intern will provide technical assistance to the R&D team, developing support software for embedded sensors. The assignments will include the following:
Android App development for communication with sensors and Sensorcloud
Embedded Linux development using the Yocto recipe environment, python functions, web server dev, kernel configuration, etc. The platform for the embedded Linux development is a Sensor Data Aggregator based off of a Beagle Bone Black.
Embedded software development for TI 280x , 283x, and MSP430 processors.
Work will be done both individually and/or with their peers, mainly in a lab environment.

Electro-Mechanical Technology
LORD is conducting R&D and design in various sensing and vibration control applications used in high speed machinery. The successful candidate will participate in such a program. Activities may entail component or system testing in a lab environment, control system design, test rig design using Autodesk Inventor, test rig assembly and checkout. Design, simulation and development of signal processing, calibration, and vibration control algorithms for use in embedded systems.

Aerospace Active Vibration Control Systems
LORD is the leader in the area of active vibration control systems for aircraft. We wish to maintain our leadership position in this area through targeted R&D programs. The successful candidate will participate in such a program. Activities may entail component or system testing, test rig development, algorithm development and tuning, prototyping new actuator concepts, and flight test preparation.

Test and Measurement; System Integration and Validation (SIV)
LORD is launching into production multiple products for Rotary and Fixed Wing aircraft. This entails extensive qualification test for certification, and electronics/mechanical automated test for our production environments. The ideal candidate has a strong affinity for

hardware/software integration, test and analysis using tools such as Matlab/Simulink and Labview. Opportunities include mining of production data to improve design and manufacturing capability. Also developing software requirements, writing code, integrating and verifying that code on a test setup. Also hardware integration, system test, and/or test equipment development. Work will be done both individually and/or with their peers, mainly in a lab environment.

Software Development/Verification Assignment

For this assignment, the engineering intern will provide technical assistance to a the Software Development Engineering team working on advanced algorithms and simulations for Active Vibration Control Systems for Rotary Wing aircraft. While assisting the engineering team during various phases of product development, the candidate will develop both technical skills in the area of embedded software development as well as communication, troubleshooting, and teamwork skills. Assignments will include a variety of tasks associated with developing software requirements, writing code, integrating and verifying that code on a test setup. Although not typical, other tasks could include those pertaining to hardware integration, system test, and/or test equipment development. Work will be done both individually and/or with their peers, mainly in a lab environment. The products being developed are currently seeking FAA/EASA certification and as such, the candidate will gain valuable exposure to the software certification process.

Thermally Conductive Adhesives and Encapsulants for Electronics

This internship is geared towards students majoring in Chemistry, Chemical Engineering, or Materials Science. LORD is a leading developer of thermally conductive materials. The research and development teams are working to launch next generation materials for electric vehicles, LEDs, and power electronics. The intern will be working with senior scientists, engineers, technologists, and business development staff to rapidly develop prototypes for external customers. Typical activities would include laboratory work, analysis of data, analytical characterization of prototypes, scale up batches, and presenting progress to technical teams.