

NASA Space Grant Intern Opportunity:

Development of Wireless Systems to Support Engine Testing

Available for: 2 students, working as a team (US Citizenship Required)

Organization: Pratt & Whitney *Eagle Works*
Systems Engineering – Validation

Technical Lead: Dr. Mary Austin

P&W Space Grant Project Coordinator: Dr. William T. Cousins, 860-565-8589

Description

This position offers the opportunity to get in on the ground floor of designing and testing a wireless sensor network for jet engine instrumentation. Work will be performed to determine which wireless standard will be most appropriate for the application. The work will revolve around a set of engine sensor requirements. An appropriate wireless platform will be identified and a wireless network simulation will be built and tested. This will lead to actual construction of a sample network, which can be tested later in the effort.

This program will be on going and it is expected that the work of the students will be easily passed on to the student successor. Because of this, the student will have to document all work and be able to explain the results to their manager and other engineers. A final presentation/review of the accomplishments will take place at the end of the session.

This challenging project involves both design and analysis capability along with a significant amount of teamwork, and therefore requires students who can work effectively in a team environment.

Skills Required

- The ideal candidate will have an electrical and computer science engineering background.
- Working knowledge of MATLAB (this will be a major tool)
- Working knowledge of C / C++
- GPA: 3.0 or better

Helpful Skills

- System simulation
- Experience with wireless systems, i.e. Bluetooth, UWB, etc. is a plus
- Implementing software on various processors
- Digital signal processing



NASA Space Grant Intern Opportunity:

Optimization of Engine Control Schedules and Strategies to Ensure Compressor Surge Free Operation

Available for: 1 student (US Citizenship Required)

Organization: Pratt & Whitney Operational Commercial Engine Systems Operability Discipline in the Systems Analysis and Aerodynamics Department

Technical Lead: Mr. Robert Legore

P&W Space Grant Project Coordinator: Dr. William T. Cousins, 860-565-8589

Description

This position offers the opportunity to work with a cross-functional engineering team supporting engine product improvement efforts and pursuing new applications for existing engines. Work will be performed to support optimization of engine control schedules and strategies in order to meet customer and regulatory agency system level requirements while managing compressor stability to ensure reliable, trouble free operation. This work will require the use of engine aero/thermal simulation tools, test data analysis tools, quantification of destabilizing influences, and statistical analysis tools. The primary focus will be on the PW4000 engine applications but work may also be required to support other commercial engine programs.

This challenging project involves analysis capability along with a significant amount of teamwork, and therefore requires a student who can work effectively in a team environment.

Skills Required

- The ideal candidate will have a mechanical or aerospace engineering background with emphasis in aerodynamics and/or thermodynamics.
- Good working knowledge of basis PC applications (e.g. Microsoft Office)
- Experience with at least one Programming language
- GPA: 3.0 or better

Helpful Skills

- Statistical Analysis and/or Modeling
- Systems analysis and control coursework



NASA Space Grant Intern Opportunity:

Parallel Processing for Gas Turbine Engine Design

Available for: 1 student (US Citizenship Required)

Organization: Pratt & Whitney High Performance Computing Team
Information Technology - TechApps

Technical Lead: Mr. Pete Bradley

P&W Space Grant Project Coordinator: Dr. William T. Cousins, 860-565-8589

Description

In the past 20 years, turbine engine design has been revolutionized by the application of High Performance Computing, especially parallel processing. During that interval, the well-known “Moore’s law” has delivered processors that double in performance every 18 months. Pratt & Whitney has developed industry-leading techniques to leverage the organic speedup of computers, regularly making impossible solutions possible, then routine, parts of the design process. Recently however, the explosive growth of CPU speed has slowed, giving way to a new paradigm of multicore processors. Instead of doubling in CPU speed, processors are now doubling in available cores while per-CPU speed increases only slightly or remains constant.

A successful candidate will participate in the design, development, and implementation of new parallel software systems for production design. Tasks may include software development and implementation, technology evaluation, and running of parallel analysis on P&W or government supercomputing resources.

Skills Required

- Computer Science background or an Engineering background with a strong interest in computational methods
- Strong interest in the intersection of computer science and physical engineering disciplines
- Fluent with a programming language such as C++, Perl, Java, C, Fortran, etc.
- GPA: 3.0 or better

Helpful Skills

- Knowledge of a CFD code such as Fluent, or Structures code such as ANSYS, NASTRAN, or LS-DYNA
- Knowledge of parallel software such as MPI
- Interest and aptitude for machines, aerodynamics and/or manufacturing
- Knowledge of Linear Algebra

