Project Title: Hardware Enabled Data Compression For Space Plasma Measurements

Project Reference Code: Russ-AspectAerospace

Name of Project Leader: Drew Russ

Host Facility: Aspect Aerospace

Internship Location: Partially Remote

Host Facility Location: 307 N University Blvd, Mobile, AL 36688

Project Description (roughly 300 words):
This project involves the design and development of hardware enabled data compression for a specialized instrument that measures space plasma properties. The instrument generates a huge volume of data, and this data needs to be downlinked to a ground station from a satellite in space. Because of the restricted link budget, compression techniques need to be developed directly on FPGA's to operate in real-time, so that the data is available "Just In Time" transmission through an available radio transceiver system.

Disciplines: Electrical and Computer Engineering.

Importance:
Space Weather hardware is becoming increasingly important to serve satellite manufacturers.

Requirements:

- **Preferred Major**
  - Electrical Engineering, Computer Engineering, or equivalent degree.
- **Class work**
  - Digital logic, classes in HDL (like VHDL or Verilog) preferred.
- **Programming knowledge**
  - C/C++, Python, or MATLAB. Verilog/VHDL preferred.
- **Software knowledge**
  - Programming tools

Biography (roughly 100-150 words):
Drew Russ graduated in Mechanical Engineering in 2022. He was the lead GN&C Engineer for Xplore in Redmond, WA and help oversee development of satellites for Xplore. He is now the CEO of Aspect Aerospace in Mobile, AL.

Is U.S. citizenship required to participate in this project? Yes

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