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Electrical/Hardware Engineer Job Requirements

General requirements:

- Bachelor or M. S. in Electrical Engineering, Computer Hardware Engineering, or equivalent;
- High-speed digital and analog circuit design, PCB layout and schematic capture using professional design software;
- Experience with common electronic communication standards: USB, USB 3.0, PCI-e, gigabit ethernet, etc.;
- Ability to create technical documentation and a habit of documenting own work;
- Electronics prototyping abilities including fine pitch soldering and familiarity with basic electronics lab equipment: Power supply, Oscilloscope, Function Generator, etc.

Project-specific requirements:

- Understanding the specifics of portable, high-performance GPU-assisted computing systems such as the need to have a robust cooling system and optimized power and battery management;
- Practical experience in 3D modeling of thermal flow, heat exchange, design and optimization of active cooling systems for high-performance computers;
- Working knowledge and understanding of biomedical ultrasound systems hardware and practical experience in developing them is a plus;
- Practical work experience in developing portable, FDA-compliant computational platforms is a plus;
- Professional experience in mechanical design with SolidWorks and/or AutoCAD

Job description:

1. Work with a team of ultrasound physicists, doctors, and biomedical scientists to design and develop a rugged portable high-performance ultrasound imaging system;
2. Engineer a compact rugged chassis providing safe electromechanical environment for the main system modules: **(1)** phased array controller, **(2)** portable computer, **(3)** external PCI-express GPU block, **(4)** display, **(5)** ultrasound probe;
3. For each electrical component, perform a thorough research on market availabilities and provide rationale for picking the item that meets prototype requirements the best;
4. Develop detailed electrical specifications and design of the power management system, autonomous battery operation and charging systems, as well as an active cooling system for the portable ultrasound phased array controller;
5. Work with the phased array controller supplier to meet the above specifications and ensure FDA compliance;
6. Develop electrical specifications for a custom rugged medical-grade matrix probe (e.g. minimizing electrical impedance mismatch, electronic noise, and maximizing gain);
7. Work with the ultrasound probe supplier to meet these specifications and ensure FDA compliance;
8. Work with a telemedicine specialist to design a telemedicine module **(6)** for the system;
9. Work with a mechanical engineer to design a rugged, ergonomic and portable carrying case for the system;
10. Work with rugged carrying case manufacturer to build a compact, rugged enclosure for all system components;
11. Integrate all components together into a rugged miniaturized system prototype. This may include working with an external integrator company and properly formulating the job description based on developed specifications 1-10.
12. Participate in the laboratory testing of the developed system in preparation for FDA clearance.