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November 8, 2018

IHMC,
Robotics Lab
40 S Alcaniz Street,
Pensacola, Florida 32502

Dear Hiring Manager:

I am Ken, the software intern who worked on the stability analysis for the simple runners this summer under the mentoring of Jerry, Robert, and Sylvain. Recently I am preparing my dissertation defense (scheduled in early December), so I am also looking for possible part time/full time positions. This job opportunity of legged robot control engineer found from the website immediately gets my attention, not only because it is closely related to my research – bipedal robot walking control – but also because at IHMC Robotics Lab, it is inspiring to work on the challenging topic (like fast-runner analysis) and I learned a lot from this internship. As a result, I think it would be exciting and stimulating to get involved in the robotics lab.

I have six years of experience working on bipedal robots. On one hand, my PhD studies mainly focus on the trajectory optimization algorithms for hybrid systems. I also have the experience of designing a QP-based controller which unifies COM planning and the QP-based torque control for the bipedal walking with ZMP constraints. On the other hand, I gained lots of hands-on experience in my master's studies when I participated to design and build a bipedal mechanism for a human-sized humanoid, and develop its electronic system, which requires lots of testing between hardware, firmware, and software. Both my internships at IHMC robotics lab and MathWorks robotics team helped me to gain more experiences about communication, software development with the concepts such as clean code, unit test, and code conventions.

It is intriguing to understand why humans are capable of performing complex, agile, and robust multi-contact motions with such a complex system while the actuators' precision and the hardware bandwidth are so limited; therefore I want to realize it more from the legged robot's perspective. For legged robots, it is challenging to find a model with proper complexity (or a proper low-dimensional space) for fast and robust reactions while the full dynamics can still be exploited at the same time. This also makes it interesting and worth be investigated.

I am confident that my research/work experiences and skills make me a good candidate for this opportunity. I have attached my resume, and I look forward to speaking with you about my qualification. Thank you for your consideration.

Sincerely,

Kenneth Chao YouTube video link: https://youtu.be/AI0nJH9yOLo