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Professor Rida T. Farouki  
Search Committee Chair  
Multibody & System Dynamics – Machine Design & Robotics  
Department of Mechanical and Aerospace Engineering  
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One Shields Avenue  
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Dear Search Committee:

I am writing to apply for both positions in the call “Two Assistant Professor Positions in the areas of 1) Multibody & System Dynamics and 2) Machine Design & Robotics” in the Mechanical and Aerospace Engineering Department at the University of California, Davis. I am currently an Assistant Professor of Teaching Mechanical and Aerospace Engineering (LPSOE) in the same department. My merit reviews and other external signs indicate I am excelling in my current position, which is focused on advancing engineering education in our department. I have been in this position for four academic years and my accomplishments over that time align with this position’s heavy teaching and educational focus. I have spent 11 of my last 14 years at UC Davis and I have a deep connection to the both the academic and regional communities. It is a cherished place for me and I have vested interest in my career path here.

My primary goal at this stage in my academic career is to move into a typical professorship where I can continue to excel at teaching and education but also have the resources and support I need to focus on and further my research program in human mobility started during my graduate and postdoctoral positions. My current position has systematic hurdles that prevent me from fully realizing my research potential even if I excel at my primary educational duties. For example, many incoming graduate students want to work with me but the lack of lab space is an immediate deterrent. This unfortunately leaves me with a deep longing for the research I love. Regardless, I have been able to maintain a steady research output with a mostly undergraduate team while also excelling at my education related activities.

My prior very active research record and what I have maintained in the last four years are reflected in the 10 peer reviewed journal publications, 16 peer reviewed conference papers, 2 draft books, 12 software packages, 30+ invited and conference talks, and over \$5M I have helped bring to the campus. My collective works have been cited over 550 times and I have an h-index of 12<sup>1</sup>, which is favorably comparable to a number of faculty already in the department. I have also demonstrated leadership in the dynamics, biomechanics, transportation safety, and computing research communities through chairing conference sessions, organizing conferences, editing journals, and acting on scientific committees. With the resources these two faculty positions could offer I will be able to launch from this already strong platform and develop as a key research contributor to the department and campus.

The UCD MAE department is at a clear turning point in its life due to the numerous retiring faculty in the past decade. These faculty defined what the world knows us for. It is certainly time to bring in many new people with new ideas but we also must steward our legacy strengths into the promising and dynamic future of the next generation of mechanical and aerospace engineering. Both advertised positions highlight this implicit desire. With this in mind, I am in a very unique position due to my strong institutional knowledge of our department and familiarity with the curriculum. I have collaborated with numerous researchers at UC Davis and have a strong regional research and engineering network tied to over a hundred projects I have been involved with over the years. I have taught eight of our undergraduate courses and taken thirteen of

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<sup>1</sup>Google Scholar: [tinyurl.com/jkm-gscholar](https://tinyurl.com/jkm-gscholar)

our courses while a graduate student. All of these courses are in the areas of multibody & system dynamics, machine design & robotics, and controls. My current course offerings are aligned precisely with the advertised positions and are a natural fit.

I also bring in new ideas and external perspective. I have spent 8 years at four other institutions. My postdoctoral training was from two of the leading biomechanicists in the world (van den Bogert and Delp) and my Fulbright year offered experience at TU Delft, one of the world's top technical universities. These experiences have provided with me with a diverse academic background and stimulus for innovation to help transform our curriculum and research activities for the next 30 years. For example, I plan to revive our lost strength in biomechanics but born anew in the form of biomechatronics to lead us into the future. Additionally, many of the retiring and retired professors that these two positions are meant to fill roles for would vouch for my likelihood of excellent stewardship of their legacy and the ability to infuse modern research and engineering themes into the future curricula.

My current research trajectory is centered around developing data-driven human-machine synergistic controllers for powered exoskeletons, powered prostheses, personal mobility vehicles (electric bicycles, scooters, wheelchairs, skateboards), and other assistive devices. These assistive vehicles and devices will play a significant role in how everyone, particularly the abled and disabled, young and old, get around both indoors and outdoors in the future. I will weave these device and vehicle technology focused efforts into the broader impact to transform our country's transportation system so that we can have a clean, multi-modal, energy efficient, accessible modes to move people from place to place indoors and outdoors. One aspect that this position could enable is an in depth exploration of the role smart self-balancing personal mobility vehicles and devices can play in enhancing the active lifestyle of elderly individuals. Also, electric bike share system companies have a growing interest in control augmented vehicles for safety and the ability to autonomously return bicycles to charging stations. This is an avenue that I plan to pursue aggressively with help from our Institute for Transportation studies new BicyclingPlus research collaborative.

I have included my research plan that centers around human mobility and how it fits here at UC Davis and a teaching statement that outlines my pedagogical practices and how I plan to contribute to new curricula if hired.

Thank you for your time and consideration.

Sincerely,

Jason K. Moore