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Siemens   May 10, 2023
Schenectady, New York, USA

Dear Hiring Manager,

I am writing to apply for the opportunity at Siemens, mentioned online on LinkedIn. As a doctoral candidate in Electrical Engineering with a focus on dynamic modeling and simulation of converter-dominated power systems, as well as a thorough understanding of power grid design, modeling, estimation, control, and co-simulation in power systems. I am confident that I have the skills and experience necessary to excel in this position. My **professional experience and achievement** are made specifically on the following:

- **I have modeled smart vendor-specific photovoltaic inverters with grid-support functions and studied their dynamics,**

- **I have formulated a system identification algorithm to extract the data-driven model for the low inertia power system dynamic studies,**

- **I designed a data-driven partitioned modeling approach and developed a comprehensive co-simulation framework to reduce computational complexity and simulation time for converter-dominated power systems,**

- **I have designed and evaluated different probing signals for the efficient implementation of state and parameter estimators in power systems,**

- **I have worked on modeling and developing detailed mathematical and reduced-order models,**

- **I developed and examined low-level probing signals using a real-time digital simulator-driven power amplifier to perturb power electronic converters and extract model parameters,**

- **I have worked on modeling and developing inverter-based resources (IBR)-rich test cases.**

I am pursuing my Ph.D. in Electrical Engineering and working in dynamic modeling and simulation of converters-dominated power systems with advanced grid support functions. Under the direct direction of **Dr.Timothy M. Hansen**, I created a **scalable and general simulation framework** for stability analysis to facilitate testing and validation of black box modeling algorithms. In addition, I worked on a **real-time digital simulator (OPAL-RT)** and **a high-performance computing (HPC) cluster** using a hardware-in-the-loop test-bed to extract the dynamics of commercial grid-connected inverters (SMA and Fronius Symo).

I also worked as an intern at **NREL** with the **Grid Planning and Analysis Center (GPAC)** where I worked on analyzing the inverter-based resources (IBRs), i.e., end-use loads and distributed energy resources (DERs) for fast frequency service to the grid.Moreover, I have also worked on the analysis of the 240-WECC system, specifically developing a high renewable penetration test case in PSS/E. This allowed me to analyze the impact of IBRs on future power systems.

I have proven my strong written and communication skills by authoring technical reports and conference proceedings, publishing articles in top-tier academic journals, and speaking at international conferences. I've also collaborated with researchers inside and outside SDSU, including Sandia National Laboratory, the University of Alaska Fairbanks, and the University of Puerto Rico-Mayaguez. This has improved my ability to work as part of a team, communicate effectively, and complete a task on time.

My academic and research experience in the modeling of converters and simulation of converter-dominated power systems are ideal for this internship position. I'd like an opportunity to further discuss my experience with you. If selected, I will be available for an interview via teleconference call. Please feel free to contact me by email or phone with any questions. Thank you for taking the time to look over my credentials. I look forward to talking with you.

Sincerely,
Sunil Subedi