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Selection Committee

I am writing this letter in support of Daniele Ioli

I met Daniele when he was a master student in Automation Engineering at Politecnico di Milano, where I'm currently full professor in Systems and Control. Since that time, I have had the opportunity to interact with Daniele on a scientific, technical, and personal level.

He worked on his master thesis project under my supervision and defended his thesis entitled "Optimal energy management of a building cooling system with thermal storage: modeling and control" in 2014.

Since the time of his master project work, Daniele clearly stood out as someone with a strong potential. He was one of the most active of my students, rapidly understanding complicated concepts and suggesting new approaches and view-points. His thesis work introduces a new model for a building cooling system that is based on energy balance equations and hence quite intuitive, suitable for control purposes due to its convexity in the control variables, and flexible enough to be extended to a multi-district framework as witnessed by our recent joint publication "A compositional modeling framework for the optimal energy management of a district network" on the Journal of Process Control, 2017. Optimization methods were proposed in his thesis to minimize the electrical energy cost of a building cooling system with a thermal storage by coordinating the operation of storage and chiller unit, while exploiting the thermal inertia of the building through the temperature set-point control.

After Daniele got his master degree in Automation Engineering, he joined my group as a research assistant, and we worked closely from 2014 to 2018 on several research projects, both methodological and application-oriented. During this joint activity, I have learned to appreciate his capabilities in rapidly focusing on significant aspects of new research topics, his excellent skill in developing original ideas focusing also on practical aspects, besides his pleasant personality and collaborative attitude.

I believe that the creativity and inventiveness of Daniele, jointly with his strong background in control, makes him a particularly valuable researcher.

We have published together 9 conference papers and 1 journal paper. Two additional journal papers are currently under a final stage of revision, one on the IEEE Transactions on Control Systems Technology and one in Automatica, both outstanding journals in control.

As for his technical skills and capability in addressing practical aspects, Daniele provided a key contribution to the smart grid use case of the H2020 EU funded international research project UnCoVerCPS on cyber-physical systems.

He visited GE Global Research in Garching, Germany (one of the partners in UnCoVerCPS consortium), and spent a total of six months as a guest researcher. His task was validating and improving our algorithms for smart grid energy management on a smart grid test facility at GEGR, consisting of a photovoltaic panel installation, a battery, a programmable load simulator, and a grid connection. Daniele successfully faced technical obstacles and challenges in implementing our data-based algorithms for the optimization of the usage of the battery to reduce the electric energy costs while accounting for the uncertainty in the PV electric energy production.

As mentioned above, I had plenty of opportunity to personally interact with Daniele. My impression has always been that he his very personable, reliable, and honest. These characteristics make him a key player in any group he is part of.

Because of all the above, I strongly support Daniele's application and I believe that he will be a tremendous asset for your institution.

Please do not hesitate to contact me if you need further information.

Sincerely,

Maria Prandini

Maria Prandini
Full Professor
Politecnico di Milano