Opportunity of Msci Dissertation (Tesi di Laurea)

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| **Context of the research activity** | |
| Motivations and objectives of the research | The Life Cycle Cost (LCC) of any energy system strongly depends on the Operation and Maintenance (O&M) costs. An O&M strategy is optimal only if it yields the largest benefit while considering the mutual relationships existing between the O&M decisions taken to manage the variable energy demand and production, the stochastic degradation and failure behaviors of the network elements and, finally, the uncertain information retrievable from PHM.  To find the optimal strategy in this setting, the O&M decision problem can be formalized as a sequential decision problem over a long time horizon. To tackle this issue, combinations of artificial intelligence and machine learning approaches, such as Deep-RL, can be used, which learn the optimal policy by interaction with a white model of the network, encoding the stochastic behavior of RES production and energy demand, and the uncertainty in the sensor signal values. |
| Field of application of the research | Energy systems |
| Required Skills | * Very good modeling skills * Very good knowledge of Pyton programming. * Interest in developing innovative algorithms to tackle real industrial applications. |
| Educational objectives | Developing and implementing novel techniques, algorithms and methodologies. |
| Names of the research director | Enrico Zio |
| E-mail address, phone number and web-page | Email: [enrico.zio@polimi.it](mailto:enrico.zio@polimi.it)  Ph: +39 02 2399 6340 |
| **Duration of the dissertation** | |
| Total thesis duration | Approximately 9 Months. At most 1 pending exam. |

**Starting date: October 2019**