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The transportation sector is currently undergoing a significant transformation, with major efforts being deployed for global decarbonization and electrification from both governments and industry. The deployment of electric vehicle charging infrastructures is therefore critical to accommodate rising numbers of electric vehicles (EV), reduce carbon emissions, and mitigate future impacts from climate change. In many developing countries, however, such infrastructures are still nascent, and transportation is still heavily dependent on fossil fuels (1).

In this project, you will develop a data-driven multi-objective techno-economic solution strategy for the infrastructure of EV charging systems. The framework will use data analytics, mathematical optimisation and machine learning to assess economic and operating implications of deploying different infrastructures, as well as their impact on emission reduction and climate abatement. The models will account for climate uncertainty and risks, as well as uncertainty stemming from markets, regulatory, and technological conditions. You will exploit Flexibility in Design strategies – also known as Real Options – to enable the system to adapt, evolve, and reconfigure, as climate and market related uncertainties unfold, with the goal of minimizing future carbon footprint, and costs. You will propose a novel decision-support system exploiting cutting edge digital technologies such as augmented/virtual reality to immerse future system operators, designers and decision-makers, and help them make better decisions under uncertainty.

You will identify the best design configurations and operational strategies via stochastic optimisation and reinforcement learning techniques, with the goal of providing better advice to government and business leaders, with an eye towards better climate sustainability and resilience. You will quantify the impact of your recommended systems and strategies on future national emissions and climate abatement policies.


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