How Artificial Intelligence Can Help Fight Climate Change?

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Abstract (300 word limit)

The changing climate will have a major impact on environmental, social and economic systems around the globe [1, 2]. Artificial Intelligence (AI) as a tool is uniquely positioned to help manage these complex issues, and can be used to help manage challenging issues related to mitigating climate change and improving adaptation and resilience [3]. For instance, due to its capacity to gather, and interpret large and complex datasets on emissions, climate changes impacts, and more, it can be used to support all stakeholders in taking a more informed actions to combat carbon emissions and building a greener society, by designing more energy-efficient buildings and vehicles, improve energy flexibility and sobriety, optimize the technological and spatial distribution of renewable energies under different penetration scenarios and storage configurations considering technical, economic and environmental multi-criteria decision making, in actual and future warming climate conditions [4 - 8]. In this study, we will particularly focus on how AI can be employed to evaluate the benefits and costs of each option and to allocate global carbon budget and climate efforts.



Recent Publications (minimum 5)

1. Ayat-allah Bouramdane, ***"Sécheresse: l'extrême va-t-il progressivement devenir la norme?",*** Énergie/mines & carrières, 12 Août (2022)**,** https://energiemines.ma/secheresse-lextreme-va-t-il-progressivement-devenir-la-norme/
2. Ayat-allah Bouramdane, ***"Chaleur Caniculaire, Incendies Gigantesques à Répétition: Des Signes du Changement Climatique?",*** Énergie/mines & carrières, 02 Août (2022)**,** https://energiemines.ma/chaleur-caniculaire-incendies-gigantesques-a-repetition-des-signes-du-changement-climatique/
3. Stein, Amy L.. "Artificial Intelligence and Climate Change." *Energy Engineering (Energy) eJournal* (2020): n. pag.
4. Ayat-Allah Bouramdane. *Scenarios of Large-Scale Solar Integration with Wind in Morocco: Impact of Storage, Cost, Spatio-Temporal Complementarity and Climate Change*. Physics [physics]. Institut Polytechnique de Paris, 2021. English. ffNNT : 2021IPPAX083ff. fftel-03518906
5. Ayat-allah Bouramdane, "Identifying Large-Scale Photovoltaic and Concentrated Solar Power Hot Spots: Multi-Criteria Decision-Making Framework", *ICEER 2023 : International Conference on Energy and Environment Research, Paris, France, 26 Septembre (2022),* https://publications.waset.org/abstracts/157186/pdf
6. Ayat-allah Bouramdane, "Site Suitability of Offshore Wind Energy: A Combination of Geographic Referenced Information and Analytic Hierarchy Process", *ICEER 2023 : International Conference on Energy and Environment Research, Paris, France, 26 Septembre (2022),* https://publications.waset.org/abstracts/157240/pdf
7. Ayat-allah Bouramdane, "Spatial Suitability Assessment of Onshore Wind Systems Using the Analytic Hierarchy Process", *ICEER 2023 : International Conference on Energy and Environment Research*, Istanbul, Türkiye, *26 Septembre (2022),* https://publications.waset.org/abstracts/157232/pdf
8. Ayat-allah Bouramdane, **"Agrivoltaïque, *de quoi parle-t-on au juste?",*** Énergie/mines & carrières, 9 Septembre (2022)**,** https://energiemines.ma/agrivoltaique-de-quoi-parle-t-on-au-juste/

Biography (150 word limit)



Born in 1995, Ayat-allah Bouramdane obtained her Ph.D. degree from the Institut Polytechnique de Paris (IP Paris, particularly at Ecole Polytechnique, Laboratoire de Météorologie Dynamique - Institut Pierre Simon Laplace "LMD-IPSL"), in 2021 [4]. Her thesis research led to a peer-reviewed publications and conference participation as a speaker.

Ayat-allah currently holds a position as a postdoctoral researcher and group leader at the GEP, IRESEN, UM6P. Her objective is to offer multidimensional solutions to move towards a climate-resilient energy transition, by sizing, modeling and optimizing current and future energy systems in Morocco to meet the electricity consumption in the most economical and environmental way, with a low risk of production-demand inadequacy.

The research interests of Ayat-allah lie in the fields of renewable energies (photovoltaic, concentrated solar power and wind), energy flexibility (thermal and battery storage, spatio-temporal complementarity, micro-grids) and climate change.

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Notes/Comments: