Cover letter

Mohamed Hachaichi

A researcher with a solid background in statistics, econometrics, quantitative and qualitative studies. I specialize in research at the intersection of demography, economics, geography, and ecology

Highlights of my qualifications include:

- Proficiency in statistical software packages such as R, and Python, with expertise in data manipulation, regression analysis, and hypothesis testing.
- Strong understanding of quantitative research methodologies, including survey design, experimental design, and observational studies.
- Experience in working with large datasets, cleaning and preprocessing data, and conducting advanced statistical analyses.
- Excellent data visualization skills, utilizing tools such as R and matplotlib to effectively communicate insights and findings.
- Strong problem-solving and critical thinking abilities, enabling me to tackle complex research questions and provide data-driven recommendations.
- Effective communication skills (5 languages), both written and verbal, allowing for clear presentation of research findings to both technical and non-technical audiences.

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Keywords: Climate change, lifestyl patterns, sustainable mobility, territorial metabolism, urban dynamics, data science

Brief introduction

Mohamed Hachiachi holds a Ph.D in *"circular urban metabolism and climate change"* from the laboratory of *"Cities, Urbanism and Sustainable Development"*. His research focuses on assessing the climate impacts and incorporating the climate component in the economic development process and simutaling sustainable urban transformations. He intends to orchestrate several research projects (sea-level rise & machine learning, WFE nexus & system dynamics, planetary boundaries & gamification, smart cities & idling capacity), both within and outside academia.

Current focus

Currently, I'm interested in designing a rapid whole system change on a global scale using new relevant sustainability metrics in a data-driven approach coupled with Artificial Intelligence (AI) algorithms. I aim to clearly identify social tipping points using behavioral mechanisms and pattern recognition to find structure in chaotic social/economic/urban environments.

Detailed introduction

My name is Mohamed Hachaichi, I have a PhD. in circular urban metabolism and climate change from the laboratory of “Cities, Urbanism and Sustainable development” at the Polytechnic School of Architecture and Urbanism (Algiers, Algeria). I am a researcher with a solid background in linear algebra, statistics, science, and programming. I’m enthusiastic about artificial Intelligence (AI) algorithms and passionate about science journalism.

I am fascinated by the research of a multidisciplinary nature. During my professional career, I’ve worked at the Polytechnic School of Architecture and Urbanism (Algiers, Algeria) as a university teacher. At the University of Stellenbosch (Cape Town, South Africa) as center manager and researcher at the African Research Universities Alliance (ARUA) Center of Excellence in Energy (CoE). At EM Normandy Business School (Caen, France) as an assistant researcher, and currently at the Institute of Urbanism and Geography Alpes (Grenoble, France) as a postdoc fellow where we work actively on assessing the territorial metabolism of French territories and figure paths towards an ecological transition.

I defended my Ph.D. thesis entitled *“Carbon Carrying Capacity (C3) as a monitoring-controlling tool for Algiers urban model towards environmental sustainability and climate resiliency”* in 2021 with a degree of ***"So honorable"***. I have published several scientific papers that can testify to my climate expertise and computational skills. For instance, I m the author of the first attempt to downscale the planetary boundaries framework to the city-scale level. I’ve also published the first paper (study/research) on estimating the virtual carbon emissions in the big cities of middle-income countries (MICs) using Extended-Environmental Input-Output Analysis (EE IOA). I’ve also published an article on how the carbon footprint can be a plea for Algiers toward energy transition. I’ve published the most comprehensive database on the virtual carbon footprint of cities, worldwide (with 24,110 cities) using machine learning algorithms. I’ve also published a work with my colleagues from the University of Stellenbosch on the impacts of climate change on the Water-Food-Energy (WFE) nexus in cities using Natural Language Processing (NLP) and machine learning under the title of Water-Food-Energy Nexus in global cities: Addressing complex urban interdependencies. In our lastest publication, we aimed to investigate and map the geneology of "circular economy" using machine learning, to our knwoledge, our approach is the first attemp in tracing the evolution of a given field using **text** as **data**.

I am excited about the opportunity to bring my expertise and experience to your organization and contribute to ongoing efforts to address the challenges posed by climate change. I am confident that my skills and experience would make me a valuable addition to your team, and I look forward to discussing my qualifications further in an interview.

Remaining at your disposal for any further information.

Thank you for your time and consideration.

Sincerely, Mohamed Hachaichi