Postdoctoral Position in AI and Data Science for Ecomanufacturing of Printable Electronics

The University of Chicago is seeking a multi-year Postdoctoral Scholar focused on AI and data science toward ecomanufacturing of printable electronics using bio-based materials. This position is funded through a U.S. National Science Foundation Future Manufacturing Research Grant (Award Number: 2037026 - FMRG: Manufacturing ADvanced Electronics through Printing Using Bio-based and Locally Identifiable Compounds (MADE-PUBLIC)). The Postdoctoral candidate will work closely with a multi-institutional, multidisciplinary faculty team consisting of Profs. Junhong Chen (UChicago and Argonne), Santanu Chaudhuri (UIC and Argonne), and Wei Chen (Northwestern).

Through this project the postdoctoral candidate will lead a highly collaborative research effort which seeks to demonstrate a cybermanufacturing platform enabled by AI/ML algorithms and an open-source biomaterials-based electronics manufacturing data infrastructure (BEMDI). The candidate will be responsible for establishing the cybermanufacturing platform through interdisciplinary research and collaboration by coordinating the data effort and leveraging the existing manufacturing infrastructure at Argonne National Laboratory.

The MADE-PUBLIC project (https://www.fmrg.pme.uchicago.edu/) aims for a future intelligent, scalable, and democratized ecomanufacturing paradigm that allows for distributed printing of low-cost, biodegradable, and recyclable electronic devices using locally identifiable resources, such as bio-based materials derived from plants. We start with growing plants in water – hydroponic growth of plants, then extract plant components such as cellulose and lignin and convert them into biobased inks that can be used to print electronic devices such as field-effect transistor sensors and lithium-ion batteries. To close the loop, we also use these battery-powered sensors to monitor the growth conditions and enable precision growth of plants with desired composition. AI/ML will help us learn and optimize each of these eco-manufacturing steps (i.e., the plant growth, the extraction process, the ink formulation, and the printing process) to achieve the best device performance. LCA/TEA provides the overall guide of the eco-manufacturing process in terms of sustainability. In addition to the eco-manufacturing science, at the end of the project a cybermanufacturing platform will be demonstrated to enable everyone to print bio-based electronic devices from their home or a nearby library. We envision this platform could help build and engage a community of innovators, such as K-12 students, UG/G, postdocs, and the general public, to explore eco-manufacturing concepts, thereby fueling innovations and training the next-generation workforce.

Qualifications: A recent Ph.D. in a relevant field (e.g., computer science, materials science & engineering, molecular engineering, mechanical engineering or other relevant science or engineering disciplines) is required. Strong motivation and communication skills in English, self-initiative, willingness to learn across fields, a collaborative team-based outlook, and enthusiasm for ecomanufacturing are essential. The following skills are desirable but not required for the ideal candidates: 1) Expertise in AI/ML and strong programming skills; 2) Knowledge in manufacturing systems; 3) Experience in data science and data infrastructure; 4) Knowledge and experience in graphical user interface design.

Applicants must complete all degree requirements before starting their appointment. The starting date is spring 2023, or as soon as a suitable candidate is identified. The initial appointment is for one year with the possibility of renewal for two more years contingent upon satisfactory performance and availability of funding. The salary is negotiable, commensurate with experience and qualifications. Interested candidates should submit a cover letter, a CV and a list of three references to Ms. Keturah Mitchell (kkd7587@uchicago.edu) in one single PDF document.

University of Chicago is an Equal Opportunity, Affirmative Action Employer of all protected classes, including veterans and individuals with disabilities. Women and underrepresented minorities are encouraged to apply.