PhD/Research Associate (all genders) – Cultural Evolution

Prof. Charley Wu invites applications for **a fully funded PhD position (4 years at 75% TV-E13; upgradable to 100% after 3 months)** to join his ERC-funded project, "*C4: Compositional Compression in Cognition and Culture,*" which investigates how principles of **information compression and compositionality** shape human learning and knowledge. Specifically, this project will examine how compositional cognitive structures drive cultural innovation over multi-generational timescales, with a focus on the evolution and transmission of causal theories and structured knowledge. **The deadline is November 12th, 2025 or until filled.**

Prof. Wu (W3 Professor for Computational Cognitive Science) leads the "Human and Machine Cognition" lab, situated at the intersection of cognitive science and machine learning. Employing rigorous theoretical frameworks and diverse computational methods—including Bayesian modeling, reinforcement learning, program induction, and information theory—the lab investigates foundational aspects of human cognition, learning, decision-making, social interaction, and cultural evolution. Prof. Wu's research is funded by Hessian AI, an ERC Starting Grant, and a LOEWE Start Professorship.

Positions will be based at TU Darmstadt, Germany, with flexible starting dates. Salaries are competitive by U.S. and European standards and commensurate with experience and expertise (German pay scale 75% TV-E13, upgradable to 100% after 3 months). The working language of the lab and broader academic community is English; fluency in German is not required, though the university provides free German language courses for interested scientific staff. For more information on Dr. Wu's research group, see: hmc-lab.com

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About us:
TU Darmstadt stands for excellent and relevant science. We shape far-reaching processes of global change—from energy transition to artificial intelligence—through outstanding scientific knowledge and innovative academic programs. Our cutting-edge research focuses on three fields: Energy and Environment, Information and Intelligence, Matter and Materials. With strong ties to the Frankfurt Rhine-Main metropolitan region (~18 mins to Frankfurt HBF by train), we have an exceptionally international orientation and actively support European integration.

About our department:
TU Darmstadt is one of Europe's leading institutions in cognitive science and artificial intelligence (csrankings.org), bringing together interdisciplinary research on cognition through the Centre for Cognitive Science and intelligent systems as a member of the European Laboratory for Learning and Intelligent Systems (ELLIS). The department provides a vibrant, inclusive research environment and encourages extensive collaboration with leading cognitive science and AI researchers, both locally (via the Hessian AI Center) and internationally.

Your profile:

- Master's degree (or equivalent) in cognitive science, computational neuroscience, psychology, artificial intelligence, or a closely related field
- Strong analytical skills and experience with mathematical modeling or computational cognitive science
- Proficiency in programming (e.g., Python, R, MATLAB)
- Motivation for rigorous scientific research and creativity
- Strong written and spoken English; German proficiency is not required

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Your tasks:

Key Responsibilities

- Design and implementation of cultural transmission chain experiments and analyze large-scale text corpora using program induction and large language models to study the evolution of causal and compositional knowledge structures.
- Development and application of computational models using methods from Bayesian modeling, information theory, and program induction
- Analysis and interpretation of experimental and linguistic data
- Preparation of scientific manuscripts and conference presentations
- Active contribution to the dissemination of research results at international conferences
- Supervision or mentoring of student assistants

We offer:

TU Darmstadt offers varied and challenging assignments, freedom to work independently, the latest technologies, good collaboration between colleagues in partnership, needs-based training opportunities and customized personnel development.

The fulfillment of the duties likewise enables the scientific qualifications of the candidate.

- Development and organisation – comprehensive in-house training offers, including the opportunity for continuing education and development;
- Annual leave/educational leave – 30 days annual leave (full-time employment) and 5 days educational leave;
- Sustainable and mobile – eligibility to free public transport in the state of Hesse with the LandesTicket Hessen (Hesse StateTicket) in accordance with the currently valid collective agreement, in addition to opportunities to working mobile at times;
- Fit and healthy – free of charge preventive medical check-ups and a wide-ranging subsidised sports programme
- Work-life balance – flexible working time models, plus BGM (*Betriebliches Gesundheitsmanagement* – University Health Management);
- Pension scheme – supplementary public service pension scheme (VBL) in accordance with the currently applicable regulations;
- University bicycle
- Family-friendliness/compatibility of family/care/career – (university-run) childcare services, child allowance (based on the collective agreement), childcare programmes during school holidays

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General information, data privacy:

TU Darmstadt intends to increase the number of female employees and encourages female candidates to apply. In case of equal qualifications, applicants with a degree of disability of at least 50 or equal will be given preference. Remuneration is in accordance with the collective agreement for the Technical University of Darmstadt (TV - TU Darmstadt). Part-time employment is generally possible.

By submitting your application, you agree that your data may be stored and processed for the purpose of filling the vacancy. You can find our privacy policy on our webpage.

Contact:

If you have any questions about this position, please contact Charley Wu (charley[dot]wu[at]tu-darmstadt[dot]de).

Your application should be written in **English** and include a cover letter, CV, masters certificate, graduate transcripts, contact info for 2 references. Most importantly, **include a short research concept** (1-2 pages) detailing your research interests, expertise, and an explanation for why you are a particularly good fit for the position (references to prior published research and links to public code repositories are appreciated).

Submit your application here: https://www.career.tu-darmstadt.de/HPv3.ApplicationForm/ShortApply/Index/51028

In case of any technical issues please contact Charley Wu with all application materials attached in a single PDF. The **subject of the email** should be "*PhD application for Cultural Evolution*"