The Project **SPATIAL REASONING IN EVERYDAY ACTIVITY** develops methods and tools for computational spatial representation and reasoning about everyday activities from the particular viewpoint of commonsense cognitive robotics. The project is part of the Collaborative Research Center (CRC) on Everyday Activity Science and Engineering (EASE), which is funded by the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG).

OPEN POSITION / SPATIAL REASONING. HCC LAB. CRC EASE.
Postdoctoral Researcher / Research Assistant / Full time: 4 years

as part of the Collaborative Research Center EASE:

- Everyday Activity Science and Engineering (EASE), University of Bremen, Germany
- Project P03 - Spatial Reasoning in Everyday Activity

- contact: Prof. Dr. Mehul Bhatt (bhatt @ uni-bremen.de)
- under the conditions of job release / please email to receive official announcement.

ABOUT THE POSITION
- Postdoctoral researcher / Research Assistant
- Full time / 48 months: July 2017 to June 2021

The position will be based as part of:

Human-Centred Cognitive Assistance Lab. (HCC Lab)
University of Bremen, Germany / http://hcc.uni-bremen.de

The position is limited to a term of up to 4 years and funded by the Deutsche Forschungsgemeinschaft (DFG) with a salary 100 TVL-13 linked to the German system.

The position may be offered as an **early career researcher position** (e.g., postdoctoral researcher), or for suitable candidates, possibly even as a **research assistant / doctoral researcher**. In case of a doctoral position, the candidate will be enrolled in and become a member of the graduate program of the EASE CRC at the University Bremen (Germany) with the purpose of successfully completing a PhD degree in Computer Science. In all cases, a commitment and desire for mobility to advance existing collaborations, disseminations is expected (e.g., support in running tutorials, short-term visits to advance collaborations, conference presentations).

POSITION REQUIREMENTS

- completed MSc / Diploma or PhD degree in
  - Computer Science, Artificial Intelligence, Computational Cognition, Robotics, or related fields

- core topics for the position include:
  - theory and practice of logic programming
  - constraint logic programming, constraint solving
  - answer set programming

- solid foundations and demonstrated experience with knowledge representation and reasoning
  - general inclination toward formal methods, and sound mathematical foundations
  - basic knowledge of computational geometry, geometric constraint solving an advantage (although not a pre-condition)

- optionally, a general interest and curiosity about related areas such as cognitive linguistics, space & language will be valuable

- secondary skills
  - excellent programming / Prolog, ASP — C++, Python, etc
  - value-added: knowledge and experience with robot motion planning is a big plus

- complementary technical expertise needed to achieve the EASE research goals include being a key member of programming teams, hackathons, competitions, tutorials, etc.

- **focus area of research project**:
  - Spatial Representation and Reasoning / please consult: www.spatial-reasoning.com

ABOUT THE PROJECT / SPATIAL REASONING IN EVERYDAY ACTIVITY

The Project "**SPATIAL REASONING IN EVERYDAY ACTIVITY**" develops methods and tools for computational spatial representation and reasoning about everyday activities from the particular viewpoint of commonsense cognitive robotics. Toward this, this project will concentrate on two aspects in the field of spatial cognition and computation: (1) models, algorithms and tools for reasoning about space and motion in the context of everyday activities, and (2) search space pruning and direct action based problem solving using computational models of spatial cognition. The starting point of research will be formal commonsense representation and reasoning techniques developed in the field of Artificial Intelligence. Here, the core focus of the subproject is on the question: "How can everyday activity tasks be formally represented in terms of spatio-temporal descriptions (that are augmented by knowledge about objects and environments) such that it enables agents to execute everyday manipulation tasks appropriately?".

The project addresses space and motion from a human-centred, commonsense formal modelling and computational viewpoint, i.e., space, as it is interpreted within the AI sub-discipline of knowledge representation and reasoning, commonsense reasoning, spatial cognition & computation, and more broadly, within spatial information theory. The core goal of the subproject is to develop general methods and tools for commonsense reasoning about space and motion categorically from the viewpoint of commonsense cognitive robotics in general, and the EASE-based robotics framework and scenarios in particular. Developed models, algorithms and tools for reasoning about space and motion will be available as an extension to existing work-in-progress declarative spatial reasoning systems.

For an overview of the core approach and methods involved in the project, please consult:

Spatial Reasoning. www.spatial-reasoning.com
Commonsense Robotics. http://www.commonsenserobotics.org

ABOUT THE EASE CRC

The Collaborative Research Center (CRC) on Everyday Activity Science and Engineering (EASE) is funded by the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG).   EASE is a fundamental research endeavor to investigate the cognitive information processing principles employed by humans to master everyday activities and to transfer the obtained insights to models for autonomous control of autonomous robotic agents. The aim of EASE is to boost the robustness, efficiency, and flexibility of various information processing subtasks necessary to master everyday activities by uncovering and exploiting the structures within these tasks.

APPLICATIONS

Applications should be submitted as a single PDF by email with the official reference number (available upon request) to:

> Prof. Dr. Mehul Bhatt (bhatt @ uni-bremen.de)

Documents should include:
1. a letter of motivation (2 pages max)
2. CV (3 pages max)
3. Two to three academic referees who may be contacted
   • for a referral at a later stage (post interview)
4. List of top five select publications
   • together with links to obtain the PDFs of the select papers

As the positions should be filled at the nearest possible date, the deadline for the application is **June 25 2017** or until the positions are filled. After the successful passing of the written applications, shortlisted candidates will be invited to an interview (either in person if possible, or via video conference). The selection process will be described once an application has been submitted. Expect to receive a confirmation of receipt of your application in less than one week of submission.

The University of Bremen aims at increasing the number of women in science and therefore explicitly encourages applications from female candidates. In the case of equal personal aptitudes and qualification, priority will be given to disabled persons. Applicants with a migration background are welcome. In addition to the scientific education, the research training group supports families.

For further enquiries please contact:
> Prof. Dr. Mehul Bhatt
> Human-Centred Cognitive Assistance (HCC Lab)
> University of Bremen / http://hcc.uni-bremen.de **|** www.mehulbhatt.org
> bhatt @ uni-bremen.de