IT-UNIVERSITETET I KØBENHAVN

PhD Call from Computer Science Department

The Computer Science Department at the IT University of Copenhagen may have vacant PhD positions for outstanding students. The PhD positions are within computer science including algorithms, databases, image analysis, information security, logic, machine learning, natural language processing, operating systems, optimization, programming languages, proof assistants, robotics, semantics, software engineering, type theory, verification and more, as well as a range of its applications.

Applicants must submit a PhD project description (statement of purpose) of 1-2 pages, and must specify which member(s) of the department faculty should be the project supervisor. Applicants are encouraged to contact prospective supervisors beforehand. Applications must satisfy the general IT University requirements.

The IT University encourages diversity of applicants regardless of age, gender, religious affiliation or ethnic background to apply for the positions.

Contact: Head of Department Peter Sestoft, email sestoft@itu.dk, or call +45 7218 5083.
Department: Computer Science, homepage: https://computerscience.wikit.itu.dk/

Possibility to apply for more specified projects in Computer Science:

Domain-specific languages and high-performance computing for pensions
This PhD project concerns (A) the design and implementation of domain-specific programming languages for the pensions and life insurance industry, and (B) the efficient calculation of reserves, cashflows and other financial quantities in that domain, using multicore and manycore (GPGPU) machines, cloud computing, code generation, program specialization and similar technologies.

The successful applicant will have a strong background and interest in programming language concepts, design, description (semantics) and implementation, and an interest in seeing these concepts and techniques applied in an industrial context through the company partner. Experience with functional programming and parallel programming is an advantage.

The project partners are Edlund A/S, Copenhagen University, and the IT University, with funding from Innovation Foundation Denmark.

Contact: Professor Peter Sestoft (sestoft@itu.dk), Computer Science Department, tel +45 7218 5083.

Basic Algorithms Research Copenhagen at the BARC Center
The BARC Center for Basic Algorithms Research Copenhagen (barc.ku.dk) is seeking a PhD student, to be employed at IT University of Copenhagen (ITU). BARC is a leading center for fundamental algorithmic research, headed by VILLUM Investigator Mikkel Thorup. BARC's core researchers at ITU, and possible supervisors for the PhD student, are Rasmus Pagh and Thore Husfeldt. The aim of BARC is to attract top talent from around the world to an ambitious, creative, collaborative, and fun environment, and to use the power of mathematics to create fundamental breakthroughs in algorithmic thinking. The ideal candidate will have proven their potential through one or more of: 1) an outstanding MSc thesis, 2) publishing in leading international venues for algorithms theory, or 3) successful participation in international competitions in informatics or mathematics.

The position is for 3- or 4 years depending on previous studies, with starting date in late summer or early fall of 2018. Financing for BARC is split between UCPH (University of Copenhagen) and ITU, and positions are to be

filled at both institutions. We encourage interested applicants to also apply for the positions announced at UCPH, see barc.ku.dk for details.

Contact: Thore Husfeldt, (thore@itu.dk), tel +45 7218 5075

Affective Robots

The overarching aim of this project is to develop an understanding of how we can design robots that to a higher degree are able to engage with and appeal to humans. The robots on the market today are almost only designed using a utilitarian perspective. In contrast, this project takes an interdisciplinary approach and combines insights from affective computing and interaction design with state-of-the-art robotics research to explore potential design strategies and physical embodiments that can facilitate richer forms of interaction between humans and robots. The topic is timely as robots move from industrial applications towards service applications. This calls for new values to better understand the development of human-robot relationships.

Contact: Professor Kasper Støy (ksty@itu.dk); Associate Professor Jonas Fritsch (frit@itu.dk).
Research groups: Robotics, Evolution, and Art Lab (REAL), Affective Interface Relation (AIR). Departments: Computer Science, Digital Design.

The PhD position depends on availability of funding.

Interactive Visual Analysis of Large Media Collections

To extract knowledge and insights from today's large and complex media collections, new analysis methods are needed that combine sophisticated multimedia analysis, scalable data management, and interactive visualisation. The goal of this project is interactive visual analysis of large-scale digital media collections that allows both laypersons and experts to interactively explore, analyse, understand, augment, and make use of the contents of large media collections.

The central ideas of this project are (1) to view the media collections in a multi-dimensional space, extending the multi-dimensional model of business analytics to multimedia analytics; (2) to unify interactive search-based and exploration-based analysis into a single data model and interface; and (3) to draw on recent advances in scalable big data systems, such as the Lambda Architecture, when implementing the data model and interface to deliver interactive performance.

The project will draw upon the extensive experience of the project leader and collaborators in scaling media applications and exploring media collections. We believe that our unified model and system will be applicable to exploring and utilizing any collection of media, including personal media collections, file systems, web archives, national archives, art collections, scientific collections, etc. A long-term vision is to radically change the way media is explored in various application areas.

Contact: Associate professor Björn Thór Jónsson (bjorn@itu.dk),
Research Group: Data Systems Research Group, Computer Science Department

The PhD position depends on availability of funding.

PhD Call from Business IT Department

The Business IT at the IT University of Copenhagen has one or more vacant PhD positions within information systems and science and technology studies, including social media analytics, IT governance, management information systems, such as innovation and new process models, digital democracy, digital change management, innovation and society and cybersecurity, as well as business and management foundations.

Applicants must submit a PhD project description (statement of purpose) of 1-2 pages, and must specify which member(s) of the department faculty should be the project supervisor. Applicants are invited to contact prospective supervisors in advance. Applications must also satisfy the general IT University requirements.

The IT University encourages diversity of applicants regardless of age, gender, religious affiliation or ethnic background to apply for the positions.

Contact: Head of Department Jens Christian Godskesen, email jcg@itu.dk, or call +45 7218 5276
Department: The Business IT Department homepage is https://businessit.wikit.itu.dk/

Possibility to apply for more specified projects in Business IT:

Organizational Management and Governance in the Age of Blockchain

This PhD research project explores how blockchain is changing organizations and their governance mechanisms. A blockchain can be described as a cryptographically enabled distributed database that holds immutable data. The technology reconciles issues of uncertainty, risk, and trust, and holds the potential for a paradigmatic shift in how economic activities are organized. The DAO, the first instantiation of a decentralized autonomous organization, already illustrated how organizations put on a blockchain are characterized by governance mechanisms that are radically different from those of more traditional organizations. Decentralized autonomous organizations are steered through decentralized decision-making and governance mechanisms that are technologically implemented as enforceable smart contracts. This PhD research project explores the changes in governance in organizational management that are induced by the advent of blockchain, and their ramifications for organizations and society as a whole.

The research project requires the application of a mixed-method approach, combining qualitative and quantitative research methods to achieve a deeper analytical understanding of the implications that the rise of blockchain poses for organizing economic activity and value.

The applicant is expected to have a strong academic background in Information Systems field and should aim for publishing his or her research in internationally leading journals. Besides making a theoretical contribution, the applicant is also expected to add value to society through research that is not only rigorous, but also relevant.

Contact person: Professor Roman Beck beck@itu.dk
Research Group: TIME

The position depends on successful funding.

Blockchain-based Solutions for Social Goods

As blockchain technology gains momentum and new avenues are sought to discover alternative solutions this infrastructural technology may afford – it becomes evident that a multi-method research approach to look into the facilitation and constitutive impact of blockchain on the perception of trust is needed. This project constitutes an important aspect for subsequent investigations of the opportunities and challenges inherent in the technical framework of blockchain technologies. Its inception is focused on the use of blockchain technology

for public goods, more specifically, for social goods. Social goods can be regarded as public goods delivered by the government or non-governmental agencies and are typically characterized as actions that provide benefit to humanity. More recently, social goods are discussed in the context of unlocking the potential of community collaborations through the use of technology to create positive societal impact.

The purpose of this research project is to identify and analyze use cases, wherein blockchain technologies change existing or create completely new processes to provide social goods. Increasingly, a concern related to blockchain-enabled transparency in transactions has enforced the need to develop alternative measures of trust. More explanatory insights are needed on how blockchain is changing how social organizations operate. Specifically, in this project the PhD student will study the changing role of trust in blockchain-based socio-technical systems for the generation of social goods.

A successful candidate must possess a profile that is situated at the interface between IS and STS. Experience with qualitative research and an aptitude to combine it with foundational information systems architectures is given a preference. The candidate should be able to publish in international outlets and make practical and academic contributions to the research area.

Contact person: Professor Roman Beck beck@itu.dk
Research group: TIME

The position depends on an available funding.

Measuring and Assessing the Business Value of Blockchain Solutions
With the quick proliferation of projects developing and implementing blockchain technology there is an issue in analyzing and understanding the impacts of such implementations across the associated business eco-system, as most blockchain solutions involve several partners. To understand these complex operational environments Elinor Ostrom's institutional analysis and development framework seems to provide a useful starting point to develop insights on issues of uncertainty, risk, speed and trust, investigating how users' potential may be enhanced through above factors and where and how created values appear mapped into the technical framework of blockchain technologies.

The research project will combine qualitative and quantitative research methods to achieve a deeper analytical understanding of the implications posed by blockchain solutions. One aim is to develop frameworks and tools to assist development and implementations to realize the potential benefits (from blockchain solutions).

The applicant is expected to have a strong background in the field of applied Information Management and should aim for publishing his or her research in internationally leading journals. An aptitude to combine the results with foundational information systems architectures is given a preference.

The project will involve close collaboration with projects and organizations/companies willing to share their data and insights with us.

Contact person: Professor Roman Beck, beck@itu.dk
Research group: TIME

The position depends on an available funding.

PhD Call from Digital Design Department

The Digital Design Department at the IT University of Copenhagen offers one or more vacant PhD positions within the areas of Interaction design, Co-design, Service design, Health & rehabilitation design, Games research, Digital media, Digital culture, and Digital citizenship & democracy.

Applicants must submit a PhD project description (statement of purpose) of 1-2 pages, and must suggest which member(s) of the department faculty should be the project supervisor. Applicants are invited to contact prospective supervisors in advance. Applications must also satisfy the general IT University requirements.

The IT University encourages diversity of applicants regardless of age, gender, religious affiliation or ethnic background to apply for the positions.

Contact: Head of Department Lone Malmborg, email malmborg@itu.dk, or call +45 7218 5023.
Department: Digital Design, homepage https://en.itu.dk/research/departments/digital-design-department

Possibility to apply for more specified projects in Digital Design:

Mixed Initiative Tools for the Game Design and Development Process
Procedural generation and other artificial intelligence techniques have become a staple of modern game development. Yet there are very few tools that embed these in the game design and development process.
This research project aims at integrating tools for procedural content generation and general artificial intelligence into existing workflows and toolchains.

A PhD student is sought to investigate topics such as (1) which existing AI-centred mixed initiative tools are used in game design and development, (2) what entry points for such tools exist in game design and development and (3) how to implement new tools and integrate them into existing toolchains and workflows. The successful candidate will have experience and knowledge in some of the following areas: neural networks, game design and development, procedural content generation, human-machine collaboration, and interaction design.

Contact person: Associate Professors Martin Pichlmair (mpic@itu.dk) and Sebastian Risi (sebr@itu.dk)
Research Group: Center for Computer Games Research and the Robotics, Evolution and Art Lab

The number of PhDs will be one. The position depends on available funding by ITU

Affective Health Design for People with Rheumatology
The PhD project will explore an affective approach to designing interactions aimed at the health sector to improve the life of patients diagnosed with rheumatology. The aim of the project is to focus on the affective and emotional features of learning to live with rheumatology, and develop new forms of interaction designs that might use micro-interactional features to effect macro-relation changes in people's lives. The focus will thus be on delivering value by designing affective interaction exploring a number of technological platforms. The project will be carried out in close collaboration with a

commercial partner who is already engaged in the rheumatology market.

The successful candidate must have a background in interaction design or Participatory Design, with an interest in developing experimental interfaces and exploring affective concerns when designing for the health sector.

Contact: Associate Professor Jonas Fritsch, frit@itu.dk.
Research Group: IxD and IxD Lab

The position depends on succesful funding.

People-centric sketching in architectural design processes
Adaptive Environments research group invites applicants for an industrial PhD position in the trans-disciplinary intersection between IoT enabled adaptivity, integrative climate engineering and emergent housing topologies, predominantly viewed from a people-centric and experiential perspective. The applicant is expected to develop a research proposal based on his or her own ideas and context of expertise.

The digitalisation of design tools and management systems has significantly enhanced architect's ability to collect, analyse and engage with data throughout design processes. The research aims to foster new conceptual and design models for integrating narratives and expanded diversity of living practices into architectural design processes in response to best practices and changing patterns of usage. The PhD fellow will engage in case studies, observing and collecting data on the liveability of inhabited projects, and take part in explorative design developments in the architectural studio.

The project will engage with elaborate design processes, building explorative prototypes and testing aesthetics and functions of designs in everyday life contexts in low-rise, high-density housing topologies. The research is people centred and seek to The research is people centred and seek to develop new sketching and representational methods that will ensure an enchased focus on the qualities of inhabitation and living practices. The research outcome is expected to contribute to architectural practice with visionary architectural design parameters, refined sketching tools, and a well-developed theoretical position.

The number of PhD's will be one with start at the latest January 2019.

Research Group: Adaptive Environments http://adaptive.itu.dk/
Contact person: Kjell Yngve Petersen; kynp@itu.dk

The available position is dependent on co-funding from Innovation Fund Denmark – Industrial PhD programme with application deadline September 2018;
http://innovationsfonden.dk/en/application/erhvervsphd
The PhD fellow will form part of a trans-disciplinary cluster of PhD fellows at BLOXHUB Science with participants from across architecture and design research; http://www.bloxhub.org/

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ALGO: Autonomous Live Game Operations
The game development and publishing processes are evolving rapidly and, contrarily to just a few years ago, the release of a game has ceased to be the end of the game development process. On the contrary, for many types of game, post-release has become the most critical phase in which content development and live operations are key to the economical success of a game production and need to be supported throughout the lifetime of the game. This situation is currently pervasive In the mobile game market and is growing rapidly in the console and PC markets.

While most of live game operations are currently data-driven and supported by a number of platforms that help to analyse the user data to extract meaningful information, most of the day-to-day work is performed manually. That is also true for decisions at any level from repetitive micro actions to the definition of long term strategies.

The purpose of the ALGO project is to address this limitation and investigate how to support live operations with intelligent tools. Based on live user data, these tools should automatise the analysis of user behaviour and synthesise effective user-tailored strategies to improve the user experience and, ultimately, improve key business performance indicators such as retention, daily active users or average revenue per daily active user.
The project will draw from the fields of player modelling, game analytics, procedural content generation and machine learning in general to design novel and effective strategies to support processes such as live event optimisation, long term engagement and personalised live player experience.

The available position is dependent on co-funding from Innovation Fund Denmark – Industrial PhD programme with application; http://innovationsfonden.dk/en/application/erhvervsphd. The PhD will be carried in collaboration between the IT University of Copenhagen and Tactile Entertainment. The project is expected to start during September 2018.

Contact: Dr Paolo Burelli pabu@itu.dk
Research group: Center for Computer Games Research

The position depends on successful funding by Innovation fund Denmark.