

PhD Spring Call 2019

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

It is important that your application reflects the mission and vision of ITU which is to deliver internationally leading teaching and research which enable Denmark to become exceptionally good at creating value with IT, and create and share knowledge that is profound and leads to ground-breaking information technology and services for the benefit of humanity. It is expected that you aim to comply with ITU's 3 core values; Direction-finding, Forthcoming, and Accountable.

Below you find calls for the Departments of Computer Science, Business IT, and Digital Design.

PhD calls – Computer Science

The Computer Science Department at the IT University of Copenhagen has one or more 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.

Contact: Head of Department Peter Sestoft, e-mail sestoft@itu.dk, or call +45 7218 5083.

Department: The Computer Science Department:

<https://en.itu.dk/research/departments/computer-science-department>

In addition to open PhD project proposals the following projects are proposed by Computer Science faculty:

Behavioural Application Program Interfaces (BehAPI)

APIs are typically flat structures, i.e. sets of service/method signatures specifying the expected service parameters and the kind of results one should expect in return. However, correct API usage also requires the individual services to be invoked in a specific order. Despite its importance, the latter information is either often omitted, or stated informally via textual descriptions. Behavioural Types are a suite of technologies that formalise of this information, elevating flat API descriptions to a graph structure of services. This permits automated analyses

for correct API compositions so as to provide guarantees such as service compliance, deadlock freedom, dynamic adaptation in the presence of failure, load balancing etc. The BehAPI project aims to bring the existing prototype tools based on these technologies to mainstream programming languages and development frameworks used in industry.

The successful applicant will have a strong background and interest in programming language design (including semantics of programming languages) and implementation.

This PhD project is linked to the funded EU RISE project BehAPI, which guarantees funds for stays abroad, including Carnegie Mellon University.

Contact: Marco Carbone (maca@itu.dk)

Research Group: Programming, Logics, and Semantics, Computer Science Department

Financing: ITU or DFF application (to be submitted)

The position depends on availability of funding.

Explainable privacy mechanisms

Applicants are sought for a cross-disciplinary project about privacy and anonymity mechanisms (chiefly differential privacy, but others can be considered). The work would involve studying how differential privacy is used (in deep learning models, NLP tasks, computer vision, tabular data analysis) in practice. The analytical component of the work will be to understand the explainability challenges and possible mechanisms, the constructive component of the work is proposing socio-technical mechanisms that elucidate new approaches to privacy protection and their influence on the quality of the anonymized data. The competences and interests of the prospective applicant should include background in machine learning, differential privacy, and science and technology studies and use of both constructive (mechanism design) and empirical (social science) study methods.

The prospective project will be placed in the intersection of the Computer Science department and the Business IT department.

Contact: Irina Shklovski (irsh@itu.dk), Andrzej Wasowski (wasowski@itu.dk).

The position depends on availability of funding.

World Event Extraction and Prediction

This PhD project involves using artificial intelligence techniques to extract world events and their contexts, and to predict future world events. This is based on automatic mining of causal and temporal relations between past events and predictive models. Events are to be extracted using natural language processing, from massive resources such as historical accounts and Wikipedia. Causal and temporal prediction of events is developed using machine learning, building on temporal models such as Gaussian point and Hawkes processes.

The successful applicant will have a strong background in computer science, data science, or a relevant discipline, with proven programming skills, and an interest in language. Experience with machine learning framework(s), and an interest/education in history, are advantages.

Contact: Assistant Professor Leon Derczynski (leod@itu.dk)

Supervisors: Associate Professor Jes Frellsen (jeffr@itu.dk); Assistant Professor Leon Derczynski (leod@itu.dk)

Research Group: Natural Language Processing Group and Machine Learning Group

The position depends on availability of funding.

Distributed business process execution under partial trust

This PhD project will provide a scalable prototype implementation of integrity-protected distributed business process execution under partial trust, that is, under precise assumptions about how much parties to the process trust each other, and what exactly a counter-party is so trusted to do or not do. Existing work on distributed business process execution generally ignores the question of trust; existing work on distributed consensus, including blockchain technology, generally has been unsuccessful in achieving scalability.

The project will achieve scalable integrity-protected process execution in a setting of more refined trust assumptions by (a) leveraging advances in hardware-based trusted execution environments; (b) adopting recent work on integrity-based execution in the business process management research community; and (c) introducing at the modelling-level primitives for specifying assumptions of trust more nuanced than simply trusting or distrusting completely. The core research question will be balancing the contradictory requirements of minimising trust assumptions while maximising performance and integrity guarantees.

Within the Business Process Management research community, this represents a paradigm shift, where in addition to formalising process rules, we must also formalise assumptions about how much we trust collaborators to follow those rules.

The successful candidate will have a strong background in integrity-protected computing (incl.~practical implementation on, e.g., blockchain technologies and trusted execution environments); cryptography incl. formal notions of correctness; formal languages for business process modelling; and distributed implementations of executable business process models.

Contact: Associate professor Søren Debois (debois@itu.dk)

Research Group: Security Group / Center for Information Security Research

The position depends on availability of funding.

Inferential question-answering

Building Natural Language Applications that truly infer facts from text rather simply extract them is a persistent challenge in Natural Language Processing. The aim of this project is improved understanding, design and development of an automatic inference-based Question Answering system over text.

The successful applicant will have some background, as well as interest, in Natural Language Processing and Machine Learning, and must possess excellent programming skills. Interest in deepening knowledge and experience in (1) Linguistics, (2) Philosophical Logic, and (3) Deep Learning is also required. Experience in these areas and in Natural Language Inference systems in Natural Language Processing is an advantage.

Contact: Associate Professor Natalie Schluter (natschluter@itu.dk) +45 7218 5313
Research Group: Natural Language Processing Group

The position depends on availability of funding.

Cryptographic Protocols for Scalable Privacy Preserving Blockchains

Current blockchain consensus protocols underpinning the security of cryptocurrencies suffer from a number of bottlenecks that severely limit the number of transactions per second processed by such systems. Moreover, the few cryptocurrencies that offer strong privacy guarantees are not compatible with the current techniques for achieving higher transaction throughput. Besides scalability concerns, current privacy preserving cryptocurrencies are also incompatible with legal financial regulations. This project aims at addressing these issues by investigating efficient cryptographic protocols for two main tasks: (1) scalable blockchain based consensus compatible with privacy preserving cryptocurrencies and (2) privacy preserving cryptocurrency and smart contract systems that adhere to financial regulations.

Research carried out within this project will be based on principles from modern cryptography, starting by establishing precise mathematical definitions for the security guarantees offered by each protocol and then designing protocols that can be proven to match such definitions. The issue of scalable consensus will be addressed through the investigation of proof-of-stake based blockchain consensus protocols with sharding capabilities, meaning that multiple chains can be grown in parallel while still achieving consensus and consistency between each other. The problem of designing privacy preserving cryptocurrencies and smart contract systems compatible with financial regulations will be tackled using techniques based on zero-knowledge proofs and secure multiparty computation protocols.

The applicant is expected to have a strong background in discrete mathematics and theoretical computer science, with an interest in applying mathematical formalism to solving practical cryptography and security problems. Experience with distributed systems or cryptography will be considered an advantage. This project will be executed in collaboration with Aarhus University in an industry partnership with Concordium, which will provide funding and potentially apply the research results on real world products.

Contact: Associate Professor Bernardo David (beda@itu.dk)
Number of positions: 1 PhD Position
Deadline for employment: June 2019
Research Group: Security Group

Next Generation Tools and Techniques for Supporting Software Reuse Decisions

Software reuse is fundamental for the development of modern software systems. However, reuse of libraries, frameworks, and APIs is associated with multiple hidden risks and costs. Indeed, selecting one upstream dependency instead of another can be highly consequential for the security, maintainability, scalability, evolvability, and even success of a software system. The successful candidate will make use of big data analysis, software repository mining, and software language engineering to study the evolution of tens of thousands of open source systems and derive empirical insights into the benefits and challenges of reuse in modern software development.

The work is fundamental for designing techniques and tools that enable developers, managers, and customers to make reuse-related decisions that increase the maintainability, scalability, security, and evolvability of software systems.

Contact: Associate Professor Mircea Lungu (mlun@itu.dk) and Assistant Professor Helge Pfeiffer (ropf@itu.dk)

Research Groups: Software Quality Group and Research Center for Government IT

The position depends on availability of funding.

PhD calls – Business IT

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, digital 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.

Contact: Head of Department Lene Pries-Heje, e-mail lpries@itu.dk, or call +45 7218 5362

Department: The Business IT Department <https://en.itu.dk/research/departments/business-it-department>

In addition to open PhD project proposals the following projects are proposed by Business IT faculty:

Exploring the Citizen Developer: When Users Take over

In today's organizations, the separation between those that develop and those that use IT is increasingly blurring. A number of recent developments, such as cloud computing, software component ecosystems, and malleable software, allow users to design the digital infrastructure that underlies their work, a development that Gartner has called "citizen developer". Yet few users have become citizen developers.

In this PhD project, you explore under what conditions and through what processes users become citizen developers. You use qualitative methods to develop theory from cases and quantitative methods (survey) to test the theory in a larger sample. You should have a strong interest in understanding how technology shapes work. Ideally, you are familiar with qualitative and quantitative research methods and with some of the technologies mentioned above.

Contact: Associate Professor Oliver Krancher (olik@itu.dk)

Research Group: TIME

The position depends on successful funding.

Making data valid: Organizing ‘what counts’ in a Danish municipality

Infrastructuring welfare delivery is a big challenge in the modern digitalized state. This is true for Denmark as well as for many other Western countries. Despite the fact that platforms for e-governance and delivery of public services have been technically implemented and are relatively reliable, communication and data sharing across organizational boundaries and with citizens continues to be experienced as problematic. Several reasons for this have been stated: unrealistic expectations to welfare delivery on behalf of citizens, lack of competences in communicating across professional boundaries or misalignment between digitalization units and the core values of the organisation.

The proposed PhD project takes a different approach by asking: What are the social and technical processes that goes in to making data valid and thus worth sharing? How does data obtain its status as worth translating to colleagues in other organisational units in the first place? By addressing these issues, the project places itself in a larger debate within Science and Technology Studies on the making of truth, validity and trust in numbers (Porter). Empirically, the project places itself in a Danish municipality. Here it will ethnographically explore validation and translation processes in social work. Key questions to be answered are: How does data obtain a status of being ‘true’? How, in governance processes and social work, does data become transferrable and translatable? What characterizes the socio-material processes of validation, and how are such processes similar or different across the organisation and between different organisations? And what are the implications of this knowledge for the organisation of data work in municipalities?

Contact: Professor Brit Ross Winthereik (brwi@itu.dk) to whom questions can also be addressed.
Assistant Professor Jannick Schou will act as co-supervisor.
Research Group: Technologies in Practice/Business IT

The position depends on successful funding.

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: 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 sociotechnical 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: 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: Professor Roman Beck (beck@itu.dk)

Research Group: TIME

The position depends on an available funding.

Blockchain for climate

Blockchain has in recent years emerged as a technology for organizing social and economic relations of trust and transparency. One of the fields where blockchain may carry some promise is in the transactions related to climate finance. Explorations of the possibilities and promises of blockchain in this area have begun to appear, but there is to this day very little thorough social science research to back up the hopes and aspirations, nor any stringent assessment of the potential pitfalls. Suggestions include that blockchain will vastly improve the overview of supply chains, compliance to contracts, and minimize waste; that it will work with new forms of influence, governance and decision-making (voting mechanisms), and that it can optimize the transfer of energy or carbon credits within schemes such as CDM or the European ETS. Much need to be investigated, nonetheless, about the consequences for collaborative work relationships in such distributed networks, and about the sociological ideals and assumptions involved in terms such as 'peer-to-peer', 'equality', 'distribution', 'decentralization', as well as what forms of value emerge from the introduction of blockchain in concrete relationships.

The PhD student should obtain an overview of existing blockchain for climate initiatives and through focused qualitative research deal with how key actors in one or more businesses or blockchain developer communities work to handle the dilemmas and contradictions of dealing with climate change through technological development. Priority will be given to applicants, who can bridge economic/organizational sociology and information studies approaches.

The PhD candidate will be part of the small research team of the SOCCAR project, which consists of two associate professors and two other PhD students, and s/he can benefit from affiliation with the European Blockchain Centre.

Contact: Associate Professor Steffen Dalsgaard (sdal@itu.dk)

Research Group: Technologies in Practice/Business IT

The position depends on the availability of funding

IT Education in the Danish School System: From Policy to Practice

This PhD project explores Danish educational policy and its framing of currently ongoing experiments with teaching concepts of technology and computational literacies in the Danish primary and lower secondary school. The project seeks to understand the formative effects of educational policies, as well as how they are negotiated in use.

Expanding the teaching of information technology in education has featured prominently on the Danish political agenda since the early 90s, but the recently initiated concrete experiments raises the stakes, and offer fresh and ongoing empirical venues for exploring the issue.

The project focusses specifically on the sociotechnical imaginaries as they are negotiated in initiatives aimed at fostering information technology's integration into education. The aim is to analyze the construction and lives of narratives surrounding technology that currently gets inscribed into primary school programs and curricula, especially, the ideal of making computational literacy part of Danish students' future general skillset/knowledge (almendannelse).

The project will draw on qualitative methodologies. It will engage in critical policy analysis of policy documents, policy deliberations, education plans and didactic materials and focus ethnographically on sites where policy gets translated and negotiated in/for practice. The project will focus on the constitution, work in the expert group that was tasked with developing various teaching experiments and examine the conduct of experiments in a municipality.

The project will locate the experiments in the landscape of educational policy through interviews with key actors in policy making and implementation such as key government actors (on the ministerial, municipal and school management level), NGOs involved in design of teaching (Coding Pirates, Coding Class) and consortiums that promote the idea of teaching computational literacy (Teknologipagten).

Educational policy is noticeably linked to several other governance areas such as labor, health etc., and thus plays its part in the formation of our collective digital imaginary, including what digital technologies on the social level are seen as good for and for whom. The project thus seeks to explicate both opportunities in teaching certain concepts of technology, such as enhancing democratization or fostering competitive advantage in global economic markets, as well as the gaps that this might create from a social justice point of view.

Contact: Associate Professor Christopher Gad (cgha@itu.dk)

Research Group: Technologies in Practice

The position depends on successful funding.

Migrants' precarity in the age of digitalization

Digital technologies not only transform how, when and where labour is performed, but also how when and where labour is declared and registered. New forms of digital citizenship, migrants' digital agency and flexibility added to the labour market through digital labour platforms, are factors that

(re)shape migrants' labour in novel ways. The digitalization of migrants' inclusion in the Danish labour market calls for research on the new sociotechnical worlds that migrants, employers, trade unions and politicians must navigate and inhabit.

The PhD candidate is expected to conduct a qualitative investigation of how digital innovation translates into the livelihoods of precariously employed migrants in Denmark. Denmark provides an exceptional sociotechnical apparatus within the EU, not only because of its industrial relations system based on low political and judicial interference in regulating labour markets but also due to the country's position as a digital frontrunner in Europe. Nevertheless, despite trade union efforts and advanced labour registration through networked digital infrastructures, risks for undeclared, underpaid and coerced labour remain imminent, especially in low-skilled jobs performed by migrants. Key questions include: how do digital, cultural and educational barriers potentially raise migrant susceptibility to precarisation given the fact that active participation is a prerequisite for successful digitalization? What characterizes migrant worker-state relations after digitalization more generally? What specific modes of organization and governance does digital labour registration for migrants enact? And as a consequence, if any, how does digitalization reconfigure the Danish industrial relations system?

The applicants are expected to have a background in qualitative social science approaches to IT such as political sciences, science and technology studies (STS), sociology or similar disciplines.

Contact: Associate Professor Vasilis Galis, (vgal@itu.dk)

Research Group: Technologies in Practice

The PhD position depends on availability of funding.

PhD calls - Digital Design

The Digital Design Department at the IT University of Copenhagen has one or more vacant PhD positions within artificial intelligence and machine learning, codesign of digital services, inclusive digitization of the public sector, computer games, digital health and wellbeing, big data and critical methods to understand social media phenomena and design of good user experiences in digital products and museums.

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.

Contact: Head of Department Lone Malmberg, e-mail malmberg@itu.dk, or call +45 7218 5023

Department: The Digital Design Department: <https://en.itu.dk/research/departments/digital-design-department-new>

In addition to open PhD project proposals the following projects are proposed by Digital Design faculty:

Social media data from political contention

The key objective of this project is to develop a cohesive theoretical and empirical understanding of social media data arising from political contention. Citizens, activists, journalists, and authorities alike voice their perspective of political protest in social media. Social media data have grown to become the largest, richest and most dynamic evidence base of political contention, but we know that there are limits to results discernible from such data. In this project, we combine the computational analysis of social media data with other approaches to trace the political, cultural and scientific practices underlying such data in the context of political protest.

Contact: Christina Neumayer (chne@itu.dk)

Research Group: Digitalisation, Data & Design (Digital Design Department)

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

Endometriosis awareness service targeted for teenagers

This PhD project will explore a service concept with digital components which increases the awareness of endometriosis of teenagers, especially teenage girls. The project will (a) design and implement a service concept which has digital elements supporting collaborative, playful learning about endometriosis, and (b) validation of the service concept in collaboration with the stakeholders. The research question of the PhD project can focus on (1) service design in relation to digital solutions supporting wellbeing, (2) effectiveness of digital solutions in increasing health awareness, or (3) design solutions or models to support collaborative and/or playful learning.

The successful applicant has a strong background and interest in design and development of digital solutions for wellbeing, and willingness to work with stakeholders to co-design and validate the developed concepts in real-life conditions. Experience on service design and implementing mobile and web applications is an advantage.

The project partners will be the endometriosis association, schools and school nurses.

Contact: Professor Minna Isomursu (miis@itu.dk)
Research Group: Digital Health & Wellbeing

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

Adapting co-design to organizational needs

The culture of participation is increasingly influencing the way organizations work, and in particular how products and services are designed. Participatory Design (PD), co-design, co-creation, design thinking, service design, workshops, 'user centered' and 'user driven' have become keywords in both the private and public sector. Organizations, even without a classical design profile like government bodies, municipalities, hospitals and industry, increasingly recognize the need for and potential of user involvement. However, the uptake of methods and approaches for user involvement in design by non-research organizations have remained rather shallow, and in a piecemeal fashion. Reasons for this can be fear of high costs and that user-involvement in design is considered lengthy and time consuming.

This PhD-project will explore existing challenges and propose a better fit between co-design methods and setups, and organization needs. The project will explore how companies and public entities can become better at co-design and how co-design processes can be supported when conducted by a non-research organization. A hypothesis is that a third entity, located between private and public sector organizations companies, or other organizations, and users, could facilitate and support co-design processes that safeguard all involved actors and their interests. Such an entity could be a public library, another public institution or NGO, that would develop its operation to become a resource for facilitating co-design, ensuring knowledge sharing, and teaching strategies for co-design to its visitors or clients.

The successful applicant is expected to have a strong academic background in interaction design, or other fields of design. Also, studies in IT-related subjects is an advantage.

Contact: Associate Professor Jörn Christiansson (jirme@itu.dk)
Research group: co-design

The number of PhDs will be one. The PhD position depends on availability of funding

Big Tech in the Danish online ecosystem

The PhD project will explore the position(s) of "Big Tech" in the Danish online ecology, mapping how technology companies such as Alphabet, Amazon, Google, and Microsoft provide infrastructures and tools for communication and exchanges on micro, meso, and macro levels.

Denmark is one of the most digitized countries in the world, but knowledge about the underlying global cast of characters remains sparse. What role do they play in the structuring of the Danish online ecosystem?

So, the aim of the project is to generate empirical knowledge about 1) the extent to which the technology companies constitute essential backbones for the online ecosystem in Denmark, 2) the extent to which Danish (public and private) actors depend upon the technology of “Big Tech”, 3) the structural and sociological implications of strategic collaborations with the technology companies, and/or 4) the potential and realized privacy implications of the position(s) of the technology companies are. The PhD project connects to current discussions about datafication, public digitalization, platform economy, and privacy.

The ideal candidate will have some technical understanding.

Contact: Associate Professor Aske Kammer, (aska@itu.dk)
Research group: Digitalization, Data, and Design

The position depends upon successful funding.

Games as Cultural History

In recent years, the role of (especially digital) games for the formation and propagation of central societal discourses has come increasingly into the focus of humanist and social science research. Areas such as identity politics, postcolonialism, and religion have already attracted considerable attention in game studies. What is missing yet, however, is an inquiry into the (arguably more fundamental) question of how games represent, reflect, and create cultural history. Ancient myths, historical conflicts and wars, medieval epics, early-modern novels, and the codified fairy tales of Romanticism form the basis not only of the most popular narratives of our age, but of political discourses of nationality as well as contentious concepts such as masculinity. Research into the traditions, varieties, and parameters of ludic engagements with cultural history will give insights into how games mirror and influence current socio-cultural developments.

We seek a PhD student to work within this complex, based on their expertise in both game studies and a pertinent field such as classical philology, medieval studies, cultural history, etc. Possible topics could include, but are not limited to: the appropriation of cultural heritage in games; games as cross-cultural mediators (e.g. Japanese adaptations of European epics); myth as a communicative strategy and mode of signification; discursive roots of current (gamer) culture in particular (esp. regional) traditions.

Contact: Associate Professor Hans-Joachim Backe (hani@itu.dk)
Research Group: Center for Computer Games Research.

There will be a maximum of one position, depending on available funding by ITU.

Designing for material-based playfulness

The goal of the project is to expand the design space of soft-robotics and other computational composites within the context of playful interaction. Through a lens of playfulness, the PhD student is expected to develop a wide range of material explorations. The project can be adapted to a range of different contexts and user groups and part of the project should be to develop methods for how to design this kind of materially engaging playfulness. Another part could be to develop a theoretical framework for playful material-based interaction design.

A successful candidate will adapt and develop a coherent three-year project within this frame drawing on their specific skills. The successful candidate has a background in interaction design, industrial design, robotics, or similar disciplinary domains, and should be fluent with physical prototyping. PhD candidates with teaching experience and/or professional experience as designers will be an advantage.

Contact: Associate Professor Miguel Sicart (miguel@itu.dk)

Research Group: Center for Computer Games Research and IxD lab

There will be a maximum of one position, depending on available funding by ITU

Machine intelligence and anthropomorphism

The so-called intelligence of increasingly pervasive AI technologies, presents an otherness that requires theorization and conceptualization. Ontologically, the intelligence of AI systems falls in the conceptual gulf between humans and machines, mimicking traits of the former while being constituted in the sociomateriality of the latter. Rather than collapsing this difference between human and machine intelligence, we might attend to the diverse sociomaterial configurations of artificial intelligence that exist in practice, and consider what other possible relationships might be opened up through conceptual design work on this alien companionship.

The proposed PhD project will strive to contribute with a conceptualization of an alien companionship between humans and intelligent machines, taking seriously the multiplicity of realities that they coexist in. Following the approach of critical technical practice, this project will involve an interpretation of engineering history, culture, and practice, focusing on smart technologies in their sociocultural contexts - paying special attention to how the overlappings and specificities of computational intelligence are conceptualized and designed. This is combined with conceptual design research to explore the limits of current notions of intelligence to open up alternative possible forms of human-machine companionship. The overarching goal is to explore the limits of the notion of intelligence as it is applied to technological design. The project sets out to recognise the necessity of diversity in thought and practice, and take on the challenge of articulating notions previously excluded from matters of concern, while supporting coexistence and dialogue within a common world.

A successful candidate must have a background in STS and AI, and experience in design research and critical technical practice.

Contact: Main supervisor, Associate Professor Laurens Boer (laub@itu.dk); possible co-supervisors, Associate Professor Marisa Cohn (mcoh@itu.dk), and Assistant Professor Baki Cakici (back@itu.dk)

Research Groups: IxD Lab, Technologies in Practice (TiP), Robotics, Evolution and Art Lab (REAL)

The position depends on available funding by ITU

Privacy & Data Practices

Social media and interactive systems are increasingly pushing boundaries for sharing of private data, through self-sharing, sharing of others' personal data and malicious data breaches, as well as accidental data leaking. New practices are slowly gaining ground but technical challenges also play a role in terms of data management and control. GDPR is just one of the recent regulations that helps to provide better data privacy through more controlled practices. It is only plausible that the future will witness even more challenges with privacy breaches and mismanagement of personal data.

This PhD project will be addressing privacy from a human-computer interaction approach, looking at people's own sense of privacy as well as actual privacy practices in relation to interactive systems such as internet of things and social media.

The PhD candidate is expected to investigate topics such as 1) privacy issues on social media 2) privacy issues in public sector domains such as children's health data and 3) privacy in relation to mobile digital services and internet of things. The successful candidate will have a background in interaction design, computer science or Human-Computer Interaction with knowledge within the specific application area the candidate chooses.

Contact: Louise Barkhuus (barkhuus@itu.dk)

Research Group: Digital Health & Wellbeing

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 chronic diseases such as rheumatology or psoriasis, and develop new forms of interaction designs that might use micro-interactive 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 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)

The position depends on available funding by ITU.