

Vision for UCPH Makerspace

A Makerspace is a laboratory, which facilitates making activities. *Making* is the collaborative and creative process of tinkering and problem solving based upon a DIY (Do-It-Yourself) mindset. Making allows for experimenting, prototyping, and constructing through the creation of meaningful artifacts by utilizing digital fabrication tools and materials (3D printing, laser-cutting, micro-controller programming, digital textiles, Virtual Reality, flexible interfaces, rapid circuit prototyping etc.) and sharing through open-source platforms to the larger international community.

The vision for UCPH Makerspace is to be a university-wide socio-technical infrastructure providing tools and expertise facilitating *interdisciplinary making*, which fosters cutting edge research, innovative research-based teaching, and engage the public and society taking advantage of the multiple disciplines, which thrives at the University of Copenhagen.

Internationally, there have been a huge interest by governments in e.g. China and USA to facilitate making within education at all levels as well as for new types of innovation and entrepreneurship¹. This interest has led to local governments to build Makerspaces using public funds², and while having the physical infrastructure, tools, and facilities are crucial – the main challenge is that it is not enough to simply have the physical surroundings – it is the people who bring in the ideas and drive, which make a Makerspace.

UCPH has a huge advantage for creating a strong community for making, since research and research-based teaching at UCPH utilizing making already exist. We already have a critical mass of researchers and students who are eager to engage and create a strong maker community across UCPH faculties. Since February 2017, where we took the first initiative to gather people across UCPH to see if there was an interest in a joint vision of UCPH Makerspace, in total 70 people across UCPH have expressed their interest, and 33 participated in the start-up meeting at Southern campus Monday March 13th 2017. People includes 57 from the faculties (30 from SCIENCE/17 from HUM/9 from SUND/2 from JUR), 12 from UCPH-cross-institutional organizations (9 from HUBs, 2 from KUB, 1 student organisation). The interest is shared by 19 researchers (6 Professor, 11 Associate professors, 2 Assistant professors), 15 research students (5 Post.doc, 10 PhD stud), as well as 20 undergraduate and graduate students. Finally, a member from Studenterhuset also joint the meeting. We have the drive which can make UCPH Makerspace into a strong platform for interdisciplinary engagement for research and research-based teaching.

UCPH Makerspace is unique, as it is based upon a grass-root movement across the university, where small workshops and laboratories already exist in close proximity of the researchers and students. However, to fully embrace the vision we need to work towards having a shared space with strong connections to the smaller local spaces. The shared space will be a space for research, research-based teaching, and entrepreneurship, which will also serve as a display into UCPH from the outside.

For **research**, there is a need for facilities, which can support researchers making and prototyping across disciplines both through the availability of machines such as laser cutters and 3D printers, but also smaller activities such as working with intelligent textiles, micro controllers, and sensors – further to utilize the digital potentials we also need to consider supporting ground breaking new ways for visualizing data including large

¹ Lindtner, S. and D. Li (2012). "Created in China: The makings of China's hackerspace community." [Interactions](#) November/December (18-22).

² Xiaomeng, G. (2015). "Science and technology minister obsessed with 'makers'." [Chinadaily.com.cn](http://www.chinadaily.com.cn/china/2015twosession/2015-03/09/content_19761231.htm) http://www.chinadaily.com.cn/china/2015twosession/2015-03/09/content_19761231.htm.

screens as well as virtual reality equipment. Part of the space should support workshop activities, where other parts need to provide the opportunity for in-depth concentration. The space should support that researchers and students from the different parts of the UCPH can come and work at the UCPH Makerspace during intense periods (weeks, months) or simply work from the Makerspace once a week. What makes the space is the people, thus it is critical that it is designed for people to be there and enjoy working in the space.

Research-based teaching and entrepreneurship supported by UCPH Makerspace concerns the capability to host classes between 20-70 students, where the focus of the learning activities is learning through making. This requires flexible large spaces, where students can work in groups, as well as get supervision and support. Master thesis students or bachelor thesis students should also be able to write their thesis in the space while having access to tools and materials as well as technical support when working on their research projects. Teachers who are interested in creating a teaching and learning module based upon making, should be able to assess UCPH Makerspace and get help in designing and executing the teaching module. In example, if a teacher wants to have archeology students to participate in a Making through 3D printing module, the technical and educational experts of UCPH will be able to design and run the module, in collaboration with the teacher.

Public events in UCPH Makerspace will make it possible to open up the university to the larger public while also impacting society in different ways. UCPH Makerspace will be open one evening each week for visitors who want to see what is going on, and once a month, there will be a talk or presentation. In this way, UCPH Makerspace will be a space which welcomes visitors. We will also have internships at UCPH Makerspace, where students (both international and UCPH) who can spend 3 months working in the space. Finally, it is critical that UCPH Makerspace does not live in a vacuum, but will have connection to Copenhagen as a city and the diverse set of Makerspaces which exist across the cities including Labitat, Nordvest makerspace, Copenhagen Makerspace, Illutron etc. Finally, UCPH Makerspace can join the Copenhagen Makers in creating events like the Makerfair demonstrating research and opening the university up to the society.

Socio-technical infrastructure is critical for success. People (researchers and students alike from all disciplines) should experience that when they come to the space (for the first time as well as every time) that they are welcome and that people in the space are ready to help them out with exploring or creating their ideas and make them real. Thus, part of the socio-technical infrastructure is that there are highly qualified resources hired to assist and support the different projects. In addition, part of UCPH Makerspace is also to change the dominating narrative about digital technologies, thus we want to invite in people, who might not have a project, but want to learn and participate. Therefore, part of the vision is to create new ways to invite in people who normally would not think of themselves as makers, and help them to become full members.

While **the long-term vision of UCPH Makerspace** is to have one shared space, with strong connections to the diverse smaller environments across UCPH; we will not wait until this exists, instead, UCPH Makerspace will be the frame for diverse activities which will be ongoing and starting now. UCPH Makerspace will plan and execute two events in 2017. Each event will be hosted by an interdisciplinary team (to be established) and open for UCPH Makerspace participants. The events will have a mixture of presentations of current work and initiatives as well as facilitating concrete activities. We will establish the interdisciplinary teams during April, while settling the dates for the two events. Each event will have its own team, who will be responsible for planning and executing the event. Further, all other activities which currently are ongoing at UCPH related to making will be shared and posted on the shared Facebook group UCPH Makerspace. We will work towards

creating a visibility of what we do across UCPH, both through local news letters and mailing lists, as well as in the University News Paper etc.

Examples of UCPH Makerspace Research

Examples of current research projects at UCPH, which relate to the research themes, which serve as the foundation for UCPH Makerspace:

- 'The Makey Project', Associate Professor Kjetil Sandvik, HUM: *The project creates new learningspaces for children through the use of Makerspaces.*
- 'Body-based User Interfaces', Professor Kasper Hornbæk, SCIENCE: *The project develops future types of interaction technology, where the body is the interface to the technology.*
- 'User Generated Law: Re-constructing law in the knowledge society', Professor Timo Minssen, JUR: *The project develops new models for IP law based upon new types of digital fabrication (e.g. 3D)*

Examples of UCPH Makerspace research-based teaching

Examples of current teaching and learning activities, which exist at UCPH due to enthusiasm and engagement, despite the lack of facilities and support, which are related to the research-based teaching themes, which serve as the foundation for UCPH Makerspace:

- 'Concept development and Innovation', Professor Pernille Bjørn, SCIENCE.
- 'Edison – development of new teaching methods, which introduces librarians to Data Science', Post.doc Lorna Elizabeth Wildgaard, HUM;
- 'Innovation and Co-creation', Simon Lex, Anthropology, SAMF;
- 'HealthZup', Lars Kayser, IFSV, SUND;

Names of people, who have expressed an interest in UCPH Makerspace

SCIENCE

- Pernille Bjørn, Professor, DIKU
- Kasper Hornbæk, Professor, DIKU
- Torben Mogensen, Lektor, DIKU,
- Tariq Andersen, Adjunkt, DIKU
- Maria Menendez-Blanco, Post doc, DIKU
- Jarrod Knibbe, Post doc, DIKU
- Claus Birger Sørensen, Chef tekniker, NBI
- Axel Boisen, Forsknings Tekniker, NBI
- Esben Flindt, Forskningskonsulent, Biologisk Inst
- Stina Matthiesen, PhD stud, DIKU
- Paul Strohmeiser, PhD stud, DIKU
- Katrine Lindvig, PhD stud, Department of Science Education
- Aske Mottelsen, PhD stud, DIKU
- Martin Dybdal, PhD stud, DIKU
- Karim Jabbar, PhD stud, DIKU
- Christoffer Back, PhD, DIKU
- Mikkel Johansen, Specialkonsulent og faglærer, Videnscenter for friluftsliv, skovskolen, IGN
- Martin Hayhurst Appel, MSc stud, NBI, Legestuen, Faculty of Science
- Alicia Berkvens, MSc stud, Bioinformatics

- Benjamin Rotendahl, MSc stud, DIKU
- Mathias Mikkelsen, stud, NBI
- Jonas Peter Hyatt, NBI og Dansk Bibliotekcenter
- Frederik Kallestrup Mastratisi, Bachelor student, DIKU
- Sven Uhrenholdt, Stud, DIKU
- Einar Rasmussen, Stud, DIKU
- Sven Frenzel, Stud, DIKU
- Sebastian Blunt, Bachelor stud, MATH
- Sofie Nielsen, Stud, Biologi
- Franchesca Andre Edwards, stud, DIKU
- Isabella Andre Edwards, stud, DIKU

HUM

- Niels Ole Finneman, Professor, The Royal Library and Information Science
- Ulrik Ekman, Lektor, Art History and Visual Culture
- Stine Lomborg, Lektor, Media, Cognition and Communication
- Sarah Davies, Lektor, Media, Cognition and Communication
- Gunhild Ravn Borggreen, Lektor Art History and Visual Culture
- Eva Andersson Strand, Lektor, Centre for Textile Research, SAXO institute
- Jacob Thøgersen, Lektor, Institut for Nordiske Studier og Sprogvidenskab
- Kjetil Sandvik, Lektor, Media, Cognition and Communication
- Charlie Breindahl, Lektor, Media, Cognition and Communication
- Lorna Elizabeth Wildgaard, post.doc, The Royal School of Library and Information Science
- Agnieszka Mlicka, Artist, researcher, visual facilitator, ENGEROM
- Line Hillersdal, Post.doc, HUM, SAXO, CoRe
- Sif Margrethe Egelind, stud, Anvendt Kulturanalyse, under SAXO instituttet
- Henrik Boensvang, researcher, Center for Information and Bubble Studies
- Line Christensen, Master student, Kommunikation & IT
- Morten Hansen, Master student, IVA, Det Informationsvidenskabelige Akademi
- Haakon Lund, IVA

SUND

- Henning Langberg, Professor, Medicin, Copenhagenrehab.dk
- John Brodersen, Professor, Speciallæge i almen medicin, Institut for folkesundhedsvidenskab
- Lars Kayser, Lektor, Department for Public Health, Social Medicine
- Adam Bohr, Adjunkt, Department of Pharmacy
- Piotr Dworzynski, PhD stud, Center For Basic Metabolism Research
- Alireza Kashani, PhD stud, Section for Metabolic Genetics
- Emil Andersen, PhD stud, Novo Nordisk Foundation - Center for Basic Metabolic Research
- Masih Sina, stud med. Member of SUND idé & Medtech entreprenør, SUND, KU
- Matias Ankjær, Bachelor stud, SUND/SCIENCE

JUR

- Timo Minssen, Professor, Center for information and innovation law, CIIR
- Sebastian Felix Schwemer, Post.doc, Center for Information and Innovation law CIIR

INNOVATION, STRATEGY, CROSS-KU

- Rikke Okholm, Konsulent - innovation i uddannelserne, SCIENCE, IND
- Lisa Svane Baltzer Parsberg, Communications Manager, SCIENCE Hub & Climate-KIC at UCPH
- Michala Brechling, Special konsulent, Strategienheden, HUM
- Adrian Price, Enhedskoordinator, CEO-Bend-O-Rama, Science forskningsdokumentation
- Martin B. Justesen, Manager, SUND Hub
- Dorthe Lynnerup, Specialkonsulent, SCIENCE Hub
- Laura Thomassen, Fuldmægtig / Academic Officer, Uddannelsesservice / University Education Services
- Frederik Nygaard, Projektleder, Copenhagen Science City - F&I
- Anders Martinussen, Systemadministrator, Faculty of Science, SCIENCE IT

KUB

- Christian Knudsen, Specialkonsulent, KUB-Nord
- Daniel Pryn, Information Specialist, KB-SAMF, The Royal Library / Faculty Library of Social Sciences

STUDENT ORG

- Michael Pallisgaard, Projektkoordinator, Studenterhuset