

How does DTU work with big data in collaboration with industry?







# Technical University of Denmark

- founded in 1829 by Hans Christian Ørsted

## Key figures 2018:

# 1,460

active collaborative  
research projects with  
the private business sector

# 16

in the world  
'Collaborative  
Publications with Industry'\*

# 6,008

Research publications

# 11,538

- including PhD 1,355
- and int. MSc 1,578

Students from 102 countries

# 6,053

Human resources (FTEs)

# 1



most innovative  
university  
in the Nordic region

# 87



new start-ups

# 52



student start-ups

DTU students were  
responsible for 52 of the  
87 new start-ups launched  
by DTU in 2018

# 50



Inventions  
commercialized

	Nordic Region**	Europe	World
Leiden Ranking Citation Impact Indicator (top 10% publications.) All sciences.	1	50	120
Leiden Ranking Collaborative Publications with Industry Indicator	3	7	16
Reuters Top 100 World's Most Innovative Universities	1	13	57
Global University Employability Ranking	8	54	119
QS World University Rankings	5	39	112

\* As per 4 June 2019

\*\* The Nordic region consists of Denmark, Sweden, Norway, Finland, and Iceland

# Collecting and processing of big data is an important scientific tool for DTU's research

DTU is highly dependent on the collection and processing of big data within a number of research areas:

- Transportation
- Energy
- Food
- Aqua industry
- Social behaviour
- Internet of things
- Health



# Big data and why it is a challenge

- Collection and processing of big data is not a problem in itself – the challenge is big data containing personal data
- Most research projects are based on a mix of personal and non- personal data
- The use of personal data is strictly regulated





# The legal framework for DTU's work with big data

EU's GDPR rules and regulations establish the framework for use of big data containing personal data

Art. 5 is the cornerstone of all use of personal data

Collection and processing of personal data must comply with a number of basic principles including:

- Personal data can only be collected for specified, explicit and legitimate purposes
- Personal data cannot be further processed in a manner that is incompatible with those purposes
- The use of data must be adequate, relevant and limited to what is necessary in relation to the purposes for which they are **processed** ('dataminimisation')
- Personal data must be processed lawfully, fairly and in a transparent manner in relation to the data subject



# Important exemptions to the basic GDPR principles

The GDPR regulation has some exemptions from the basic principles of utmost importance to all research activities:

- Further processing for research purposes shall always be compatible with the original purpose.
- Specific access to process sensitive data for research purposes.
- When processing data for research purposes, special attention must be paid to data minimization and anonymization
- The rights of the data subject are limited with regard to research data
- Research data cannot be used for other purposes than research
- Limited access to share the data



# Big Data – a strong platform for collaboration

The research exemption in the GDPR regulation gives DTU and other Danish public research institutes a wide freedom to operate with regard to collection and processing of big data

Thus, the research exemption in the GDPR regulation provides DTU with a very strong platform as "data facilitator" between academia and industry and a very strong foundation for the collaboration between DTU and our industry partners



# DTU Exchange of data between DTU and industry collaborators – the business model

- DTU is restricted from providing its industry partners with samples and cohorts of personal data
- DTU may provide results, trends and patterns based on the processing of big data from various sources
- DTU may use big data for test purposes of new inventions, new technology, products etc.







# Computerome – the national supercomputer for life sciences

The Danish National Life Science Supercomputing Center, Computerome, is a HPC Facility specialized in Life Science.

Users include research groups from all Danish universities and large international research consortiums as well as users from industry and the public Health Care Sector.

They all benefit from the fast, flexible and secure infrastructure and the ability to combine different types of sensitive data and perform analyses





# The "Energy Lab Nordhavn" – sustainable solutions for a green future



# Guiding principles for collaborative research activities

- Equal treatment
- Comply with state aid rules
- Dealing on market terms
- Ownership to IPR based on intellectual contribution
- No **Professor's** Privileges
- Publication
- Striving for a win/win solution





# How can DTU collaborate with industry?

## Co-financed research

- University must have a research interest
- All parties must contribute economically and intellectually
- IPR is shared based on intellectual contribution
- IPR is transferred on market terms

## Commissioned research

- The project is a natural spin-out of the **University's** research and other main activities
- The project is fully funded by the company according to rules for revenue generating activities
- Company gets ownership of IPR