



# **Strategy Seminar May 19 at Sofia**

Professor Sasu Tarkoma, Head of Department  
Department of Computer Science  
University of Helsinki



# Agenda: Friday 19.5.

8.00 – Bus transportation from Kumpula and Kiasma

8.30 – 9.15 Breakfast buffet

**9.15 – 10.00 Opening seminar in auditorium**

10.00 – 12.15 Workshops in separate rooms

12.15 – 13.00 Buffet lunch

13.00 – 14.15 Group presentations (groups 1-3, 25 min/each)

**Group photo!**

14.15 – 14.45 Afternoon coffee

14.45 – 16.25 Group presentations (groups 4-8, 20 min/each)

16.30 – 17.00 Summary

17.00 – 19.00 Sauna, towels from Sofia, please take your swimming suit if you plan to swim

19.00 – 21.00 Buffet dinner

21.00 – Bus transport, 1 bus to Kumpula and 1 bus to Kiasma



# Outline

News

Overview of strategy and environment

State of the Department

Statistics for 2016: publications and education

Budget 2016 and discussion

Recruitment Plan

Data Science and Helsinki Data Science Centre (HiDATA)

Infrastructure roadmap

# News and Updates

Annual report 2016 soon completed

Departments will cease to exist as independent budget units in 2018.

Data Science Center (HiDATA) coordinated by HIIT will be launched during 2017

Ukko 2.0 soon operational. Total number of cores is 864.

GPU extension in 2017

5G test network extension to Kumpula soon operational.



# New Faculty Structure / Uudet Osastot

Fysiikan osasto (Department of Physics)

Ilmakehätieteiden keskus INAR (Institute for Atmospheric and Earth System Research)

Geotieteiden ja maantieteen osasto (Department of Geosciences and Geography)

Kemian osasto (Department of Chemistry)

Matematiikan ja tilastotieteen osasto (Department of Mathematics and Statistics)

Tietojenkäsittelytieteen osasto (Department of Computer Science)

Tietotekniikan tutkimuslaitos HIIT (Helsinki Institute for Information Technology)

# Faculty Planning Schedule

May 2017: Draft Faculty budget

June 6, 2017: Decisions pertaining to Faculty structure in 2018, decision by Faculty Council

June 8, 2017: Deadline for Dean applications

Sept-Oct, 2017: Strategic plan of the Faculty. Draft to Rector on 16.10.2017.

Sept-Oct, 2017: New Deans are appointed, applications for Department Heads

Nov-Dec, 2017: Election of the Faculty Council, Dean decides the Heads of Department, Vice-Deans are appointed, approval of the Faculty strategic plan (5.12.), budget decisions for departments

# Program for H1 2017

**30.1. 09:00** Morning Coffee: Professor emerita Kaisa Nyberg gave a talk about recent developments in cryptography.

**6.3. 09:00** Morning Coffee. The topic pertains to the Internet of Things with a talk from Elisa

**31.3. 14:00** Staff meeting: structure of the Faculty of Science 2018 and beyond

**21.4. 14:00** New professor lectures: Tommi Mikkonen and Ville Mustonen

**Planned:** Seminar on AI

**19.5.** Strategy Day of the Department at Sofia.

**8.6.** Summer event (visit to Raasepori)

**16.6. 14:00** Communications Seminar for the Staff

**Planned:** kickoff for Ukko 2.0 and 5G testbed

**31.8:** Department's 50<sup>th</sup> Anniversary, joint with the Annual Event of the Finnish Society for Computer Science

# Strateginen kehys

## Strategy and environment

Laitoksen kaksi keskeistä painopistettä ovat tietojenkäsittelytiede ja uudempana avauksena datatiede tietojenkäsittelytieteen lähtökohdista. Näiden kahden painopisteen osalta laitos on profiloitunut neljään niitä eri painotuksilla tukevaan alueeseen:

1. koneoppiminen ja algoritmit
2. tietoverkot ja hajautetut järjestelmät
3. ohjelmistojärjestelmät
4. bioinformatiikka

Tutkimuksessa painotetaan vuonna 2017 seuraavia erikoisaloja:

- datatiede, 'big data' ja laskennallinen luovuus
- tietoturva
- elämäntieteiden informatiikka

The Department is responsible for the teaching and research in Computer Science at the University of Helsinki. As a newer theme, the Department focuses on Data Science. The Department has four key topics:

1. machine learning, data analytics, and algorithms
2. networking and services
3. software systems
4. bioinformatics

In 2017 research emphasis is on:

- Data Science, Big Data, and computational creativity
- Security & Privacy
- Life Science Informatics

***Missio:*** Laitoksen tavoitteena on olla Pohjoismaiden johtava tietojenkäsittelytieteen laitos. *To be the leading CS Department in the Nordic countries*



# Vision

Architects of Digital Infrastructure

Research Excellence

Excellence in Education

Impact through Science and Applications

Pioneering new Science and Solutions

# Toimenpiteet 2017

## Action Plan 2017

### **Vuoden 2017 tärkeimmät toimenpiteet ovat:**

Datatieteen tutkimuksen ja opetuksen vahvistaminen: 2016 rekrytoitujen professorien integroituminen laitokselle ja tarpeellisten uusien professuurien avaaminen. Kaavaillun Data Science Centerin käynnistäminen. Profiloituminen Helsingin yliopiston elämäntieteitä (HiLIFE) ja Digital Humanities (HELDIG) tukevaan datatieteeseen.

Siirtyminen Iso Pyörä-ohjelman mukaisiin uusiin kandi- ja maisteriohjelmiin ja toiminnan vakiinnuttaminen.

Helsingin yliopiston rakenteen muutokseen liittyvä tutkimuksen organisoinnin suunnittelu: suunnitelma toiminnasta laitoksettomassa tiedekunnassa.

Suomen Akatemia:  
lippulaivaprojektit?

Uudet Tekes ohjelmat?

### **Important actions for 2017:**

Strengthening the research and teaching in Data Science: supporting the professors recruited in 2016 and establishing new professor positions. Launching of the envisaged Data Science Center. Participation in HiLIFE and HELDIG.

Transition to Big Wheel (Iso Pyörä)

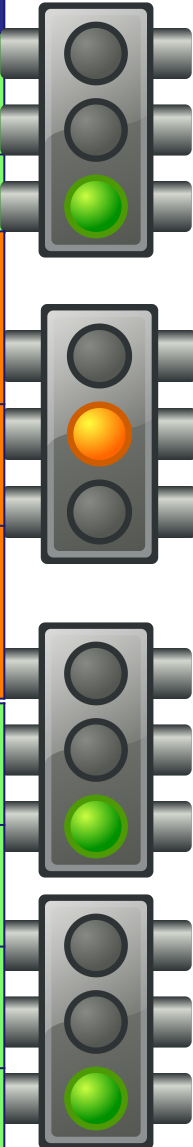
Planning for the possible new organization structure in 2018: faculties without departments

Academy of Finland: call for  
flagship projects!

New Tekes programs?

# State of the Department

Area	State
Vision	Department is focusing on Core CS and Data Science, good progress on multiple fronts. Planning for 2018 and beyond.
Big Wheel reform	Excellent progress
Service organization	On-going. Concern: Most administrative personnel resources are shared by the departments. Communications is not effective (pulse, pressreleases, media mentions, etc).
IT support	Relying more on TIKE (IT Services). A new Science IT team has started.
Visibility	Web page project progresses slowly. Web presence will be partitioned in the future (Big Wheel, Flamma, research)
External funding	Good progress in general. Tekes funding drop not as great as feared. New large-scale industry projects.
Fundraising	Excellent situation with a large Nokia donation. New donations expected for 2017.
Academic impact	<b>#1 in Finland based on global university rankings (THE, QS). #1 in Nordic countries in THE and #3 in QS.</b>
Resources	Six new TT/Prof positions in the process, roadmap for new professors positions. New infrastructure: Ukko 2.0, 5G test network.



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# Publications

Publication category	2016	2015	2014
A1 Refereed journal articles	69	72	75
Refereed conference and compilation articles, evaluations (A2-A4)	108	114	113
Other publications	38	39	39
<b>Total number of publications</b>	<b>215</b>	<b>225</b>	<b>227</b>

# Education

**Department met the 2016 education targets for BSc and MSc degrees**

M.Sc. theses 83, M.Sc. Degrees 83 (target 71)

B.Sc. Degrees 93 (target 90)

PhD program: 6 (we aim for 8-10)

**Department is very popular major:**

2016: 173 new students (96% of maximum), 71 accepted international call, 29 started studies (41%)

# Big Wheel

Doctoral School in **Computer Science** (DoCS)  
Director: Prof. Petri Myllymäki

M.Sc. Programme in  
Life Science Informatics

M.Sc. Programme in  
Theoretical and Computational  
Methods

M.Sc. Programme in  
**Data Science**  
Director: Prof. Hannu Toivonen

M.Sc. Programme in **Computer  
Science**  
Director: Prof. Veli Mäkinen

B.Sc. Programme in  
Mathematical Sciences

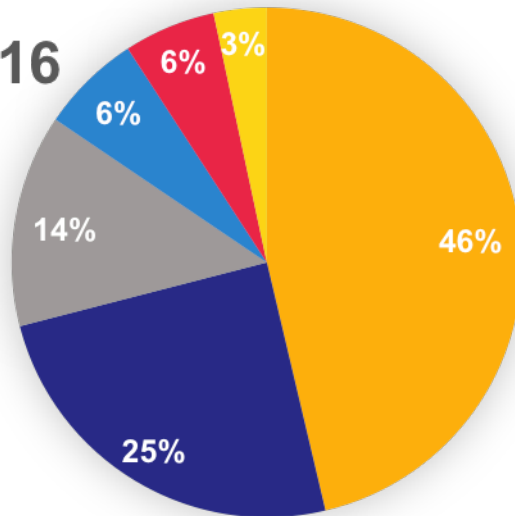
B.Sc. Programme in **Computer  
Science**  
Director: Dr. Kjell Lemström



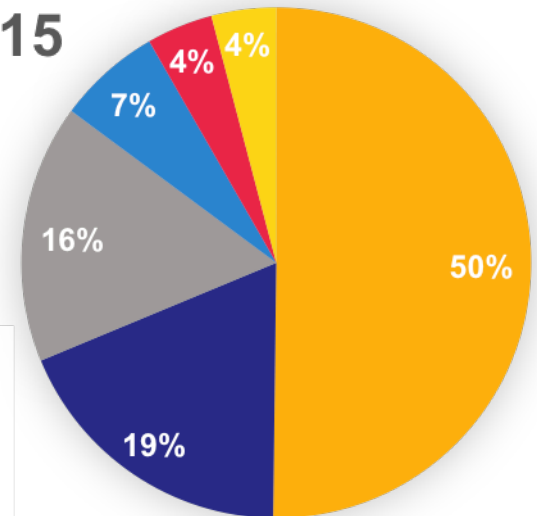
# FUNDING SOURCES

	Tulosyksikkö	Toteuma 1 - 12 /2016	Toteuma 1 - 12 /2015	Erotus	Erotus %
Perusraha	TKTL	5 509 845	6 481 446	-971 601	-15 %
Suomen akatemia	TKTL	2 935 391	2 394 942	540 449	23 %
Tekes	TKTL	1 606 009	2 116 637	-510 628	-24 %
EU (Suora)	TKTL	756 761	847 635	-90 874	-11 %
Liiketoiminta	TKTL	691 443	541 348	150 095	28 %
Muu rahoitus	TKTL	399 381	530 243	-130 861	-25 %
<b>Rahoitus yhteensä</b>	<b>TKTL</b>	<b>11 898 830</b>	<b>12 912 251</b>	<b>-1 013 420</b>	<b>-8 %</b>

Rahoitus 2016



Rahoitus 2015

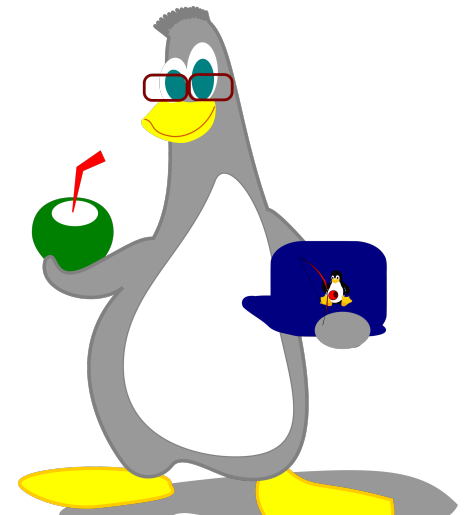


- Perusraha
- Suomen akatemia
- Tekes
- EU (Suora)
- Liiketoiminta
- Muu rahoitus



# Current Recruitments in Process

1. **Nokia Chair in Data Science.** Professor Pan Hui from HKUST will start in September.
2. Tenure track position in **Data Science.** Profi #1.
3. Tenure track position in **Life Science Informatics.** Profi #1.
4. Tenure track position in **distributed systems and networking.**
5. Tenure track position in **algorithms and machine learning.**
6. Tenure track position: **Algorithmic data science with focus on SSH applications.** profi #2.



# Planned Recruitments in 2017-2018

1. University Lecturer pertaining to **MOOCs**. Spring 2017.
2. University lecturer pertaining to **Data Science**. Related to HiDATA activity. Under discussion.
3. Tenure track position in **Software Systems**. Fall 2017.
4. Tenure track position in **Theoretical Computer Science**. Joint position with Mathematics and Statistics. 2017.

# Planned Profi #3 Recruitment

1. Computational methods with applications to Earth system and weather modelling (with INAR) [2017]
2. Sustainability spatiotemporal data analysis (with HSSC) [2017]
3. Software systems for data-intensive computing in natural sciences [2017]
4. Parallel and distributed data science [2017]
5. Statistical machine learning and computation statistics [2018]
6. Knowledge discovery in big data, with atmospheric applications [2018]
7. Tomographic processing and image analysis [2018]
8. Privacy-aware and secure data science [2018]

data mining  
data analysis  
statistics  
machine learning  
distributed computing

natural sciences and engineering  
life sciences and medicine  
humanities, social sciences  
pedagogics, economics

**Methods**

**Applications**

# HiDATA

Data Science



Research  
results



Education  
of experts



Innovations



Information for  
the general public

# CS Infrastructure Roadmap

2016-2017: Ukko 2.0: two big servers with 3 TB RAM and 32 compute nodes with 256 GB RAM. Total number of cores is 864. 4 x NVIDIA TESLA P100.

2017: New routers: 150 000 EUR

2017: 5G testbed 1.0

2018: Petabyte-level non-volatile storage

2018: 5G testbed 2.0 with edge servers

2019: “Beyond fog and edge computing” test environment

2022: Ukko 3.0

20??: Quantum Computer

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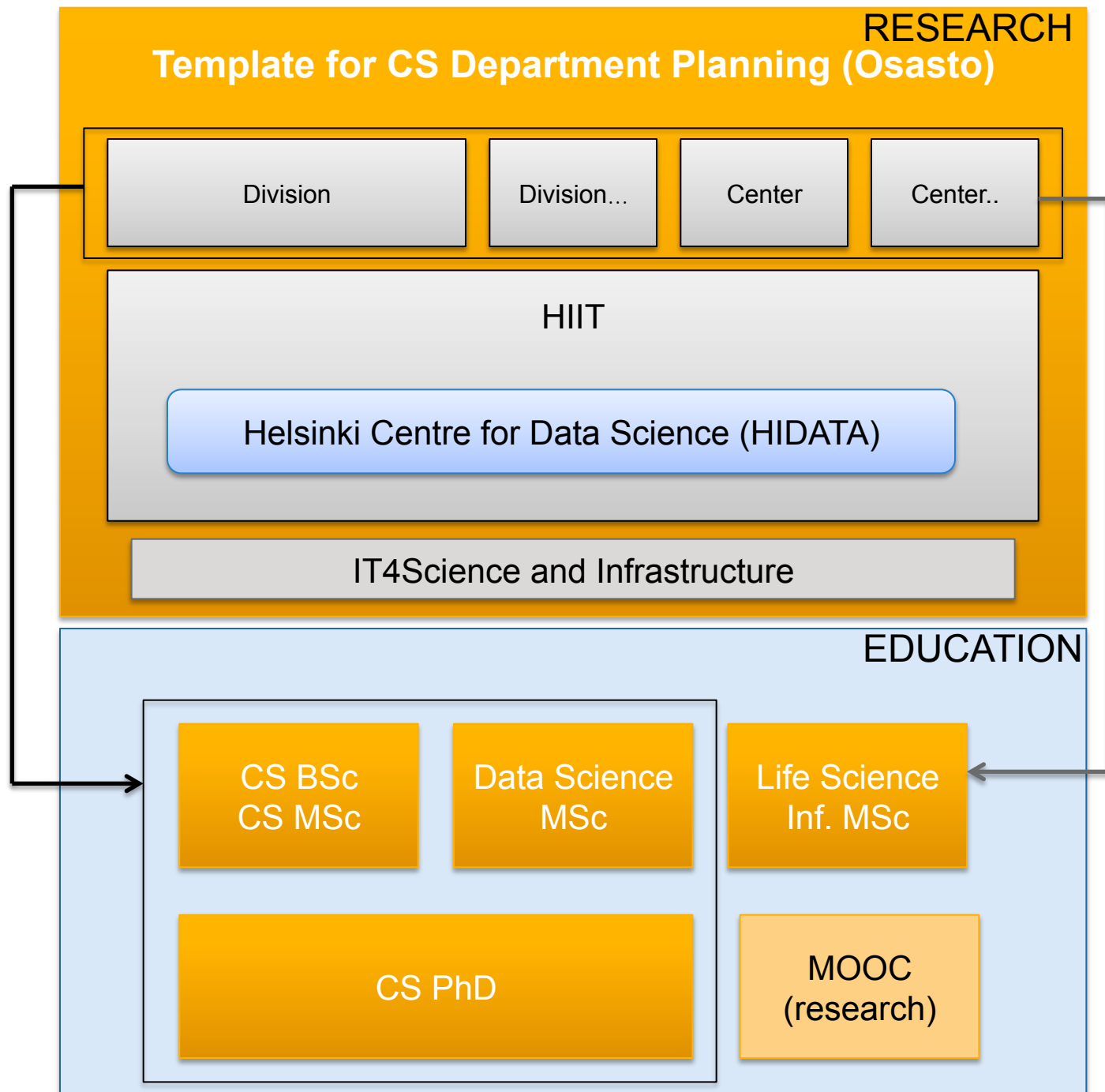
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# Groups and Rooms

1. Laitokseton tiedekunta ja rakennemuutos / The Reorganizing Faculty 2018 (Esko Ukkonen) – Room **MÄNTY**
5. Uudet avaukset: tutkimus / New openings in research (Tommi Mikkonen) – Room **KUUSI** (No 2)
2. Iso Pyörä / Big Wheel (Veli Mäkinen) – Room **KOIVU** (CD, downstairs)
3. Laitoksen verkkoviestintä, näkyvyys ja palvelut / Web presence and communications (Lea Kutvonen) – Room **AUDITORIUM**
4. Infrastrukturi, 5 G ja Ukko /Infrastructure (Petri Kutvonen, Valtteri Niemi) – Room **KALLIO (C-house)**
6. Uudet avaukset: opetus / New openings in education (Kjell Lemström) – Room **LEPPÄ** (AB, downstairs)
7. Työhyvinvointi ja tilat / Wellbeing and facilities (Antti-Pekka Tuovinen) – Room **POIJU** (No 4)
8. YPA & hallintoasiat /Administration (Pirjo Mulari) – Room **HONKA** (No 1)





# CS Department



## Strategy Day 2017

# Thank You

