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 end 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 maantieteiden 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)
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: 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 50th Anniversary, joint with the Annual Event of the Finnish Society for Computer Science
Strateginen kehys

Strategy and environment

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 tietojenkäsittelytieteiden 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 yliopis-
ton elämätieteitä (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.

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

Suomen Akatemia: lippulaivaprojektit?
Uudet Tekes ohjelmat?

Academy of Finland: call for flagship projects!
New Tekes programs?
## State of the Department

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


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## Publications

<table>
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<tr>
<th>Publication category</th>
<th>2016</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 Refereed journal articles</td>
<td>69</td>
<td>72</td>
<td>75</td>
</tr>
<tr>
<td>Refereed conference and compilation articles, evaluations (A2-A4)</td>
<td>108</td>
<td>114</td>
<td>113</td>
</tr>
<tr>
<td>Other publications</td>
<td>38</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td><strong>Total number of publications</strong></td>
<td>215</td>
<td>225</td>
<td>227</td>
</tr>
</tbody>
</table>
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%)
Doctoral School in **Computer Science** (DoCS)
Director: Prof. Petri Myllymäki

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

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

M.Sc. Programme in **Life Science Informatics**

M.Sc. Programme in **Theoretical and Computational Methods**

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

B.Sc. Programme in **Mathematical Sciences**

Big Wheel
**FUNDING SOURCES**

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

**Rahoitus 2016**

- **Perusraha**: 25%
- **Suomen akatemia**: 14%
- **Liiketoiminta**: 6%
- **Tekes**: 6%
- **EU (Suora)**: 3%

**Rahoitus 2015**

- **Perusraha**: 50%
- **Suomen akatemia**: 19%
- **Liiketoiminta**: 4%
- **Tekes**: 4%
- **EU (Suora)**: 7%

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


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]
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]
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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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)
Template for CS Department Planning (Osasto)

HIIT
Helsinki Centre for Data Science (HIDATA)

IT4Science and Infrastructure

EDUCATION

CS BSc
CS MSc

Data Science MSc

Life Science Inf. MSc

CS PhD

MOOC (research)
CS Department

Strategy Day 2017
Thank You