Parallel and Distributed Systems
Speaker: Dick Epema
Group: Alex Iosup, Johan Pouwelse, Henk Sips + speaker
The Parallel and Distributed Systems Group

Dick Epema
- Grids/Clouds
- e-Science
- P2P systems
- Online Social Netw.

Alexandru Iosup
- Grids/Clouds
- P2P systems
- Big Data
- Online gaming

Johan Pouwelse
- P2P systems
- Online Social Netw.
- Video distribution
- Security

Henk Sips
- HPC systems
- Parallel computing
- Multi-cores
- P2P systems

Home page
- www.pds.ewi.tudelft.nl

Publications
- see PDS publication database at publications.st.ewi.tudelft.nl
M.Sc. Thesis Projects: The Supervision

• We help you excel, without pushing
  • 2 x “I want a 6” → 2 x “Great, an 8!” (we try to motivate you)
  • 1 x “I want an 8” → 1 x “Super, a 9!” + Cum Laude
    (you do not waste your talent with us)

• We are results-oriented
  • Real-life, real-scale projects + working systems → a demo for your CV

• We walk the extra mile
  • We help with finding a job (letters, etc.)
  • We want you to succeed as a professional!

• International setting
  • Our group is international
  • We often organize the top international conferences in our field
M.Sc. Thesis Projects: The Content

- MSc projects can be
  - internal in a research project (collaboration with PhD students)
  - external (e.g., in Bitbrains, NIKHEF)

- Flavor of MSc topics:
  - conceptual and
  - experimental
  - devise new concepts and show that they work

- For examples of previous MSc projects see the theses on the PDS website
M.Sc. Thesis Projects: The Skills

Thesis =
Problem statement +
Project + Report/Presentation +
Process Planning & Operation +
Communication + Periodic reporting +
Independence +

[only M.Sc. and Ph.D.]
Novelty + Dissemination + Research-group integration + Peer review +

[only Ph.D.]
Collaboration + Networking + Impact + Mobility + International recognition
### M.Sc. Thesis Projects: The Process

<table>
<thead>
<tr>
<th>Level</th>
<th>Learning period</th>
<th>Period of becoming independent</th>
<th>Empowered period</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Sc. (2 months)</td>
<td>No time</td>
<td>Month 1</td>
<td>Months 2–3</td>
</tr>
<tr>
<td>M.Sc. (6–9 months)</td>
<td>Months 1–3</td>
<td>Months 3–6</td>
<td>Months 6–9</td>
</tr>
<tr>
<td>Ph.D. (4 years)</td>
<td>Year 1</td>
<td>Year 2–2.5</td>
<td>Year 2.5–4</td>
</tr>
<tr>
<td>Honors Track B.Sc. (15 ECTS)</td>
<td>1/3 of the time</td>
<td>1/3 of the time</td>
<td>1/3 of the time</td>
</tr>
<tr>
<td>Ph.D.-level visit (3/6/12 months)</td>
<td>No time</td>
<td>Months 1/1–2/1–3</td>
<td>Months 2–3/3–6/4–12</td>
</tr>
</tbody>
</table>

- Each student is unique: no “9 months”, but “learning → becoming independent → being independent”

- Weekly meetings when it’s difficult, monthly meetings otherwise (we have an interest that you to do well)
IN4049 Introduction to High-Performance Comp. (Q1)

- HPC: technical skills + numerical methods for scientific progr.
- Programming models for HPC, performance analysis
- Lectures + Lab + Exam
IN4392 Cloud Computing
(Q1, this course is **gamified**)

- Lectures + 1 x Group exercise + Presentation + Reviews
IN4026 Parallel Algorithms and Parallel Computers (Q3)

- Parallel Computers
  - basic architectures and communication operations
  - performance and scalability,
  - Parallel programming languages

- Parallel Algorithms for:
  - matrix operations
  - sorting and searching
  - graph operations

- Lectures + Lab + Exam
IN4150 Distributed Algorithms (Q3)

- Managing distributed systems
  - Mutual exclusion
  - Election (who is the boss?)
  - Detection of global states (global view of a running system)
  - Reaching consensus despite failures (agreeing on a single bit)

- Lectures + Paper Review + Lab + Exam
IN4253 Hacking Lab—Applied Security Analysis (Q3)
IN4391 Distributed Computing Systems (Q3, this course is gamified)

• Distributed computing systems are everywhere
• Performance, efficiency, scalability, reliability, fault-tolerance
• Lectures + 2 x Group exercises + Exam