

State-of-the-art in Mobile Computing and Communication

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My CV

- MSc: Numerical analysis
 - stiff differential equations
- PhD: Capacity planning of computer systems
 - workload modeling, response time distributions
- Post doc: Simulation theory
 - precision control in multidimensional simulation
- Professor: Leading the NODES group
 - telecom software architectures
 - real-time databases/computing for telecoms
 - mobile computing and communication
- “New life”
 - operating system issues for future mobile computing

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University of Helsinki Department of Computer Science

UNIVERSITY	DEPARTMENT
<ul style="list-style-type: none"> • Founded in Torino in 1640, moved to Helsinki in 1828 • Largest university in Finland • Aline Facilities <ul style="list-style-type: none"> – Theology, Law, Medicine, Arts, Science, Education, Social Sciences, Agriculture and Forestry, Veterinary Medicine 	<ul style="list-style-type: none"> • Founded in 1967 • Part of the Faculty of Science • Staff (2002) <ul style="list-style-type: none"> – Professors 13+2 – Researchers 81 – Teachers 36+58 – Other staff 15

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Department of Computer Science

M.Sc. PROGRAMMES	SECTIONS IN CS
<ol style="list-style-type: none"> 1) <u>Computer Science</u> 2) Applied Computer Science 3) Teacher in Computer Science 4) Professional upgrading programme 	<ol style="list-style-type: none"> a) Algorithms b) Intelligent Systems c) Software Engineering d) <u>Distributed Systems and Data Communications</u> e) Information Systems

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The NODES Group

- 3 professors
- 8 ass. professors
- c. 20 researchers in projects
 - c. 10 M.Sc. students
 - c. 10 Ph.D. students
- c. 10 Ph.D. students in industry

Motto:
Any technology distinguishable from magic is insufficiently advanced.
Gregory Benford

NODES Research Areas:
Wireless Internet, Distributed Software Systems, Formal Methods for Protocol Development, Trust-Privacy-Security, Linux Development

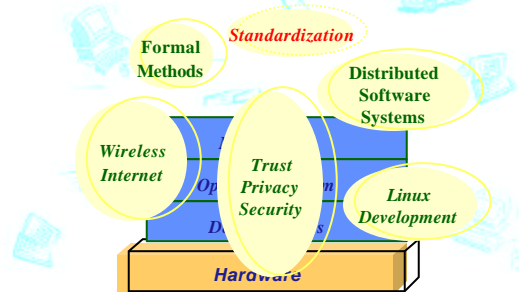
- Studies how systems can be divided into independently working parallel parts, and how these parts communicate with each other
 - functionality in the basic components,
 - the protocols between the parts,
 - performance evaluation

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NODES Background

- In early 80's the focus was on *operating systems and performance analysis*
- In mid 80's personal computers and data communication networks came to market
 - The focus moved to *data networks and distributed applications*
- In early 90's portable computers and handsets
 - The focus shifted to *wireless data communications and mobile computing*
- In late 90's the theme was world wide access
 - World wide *international standards* became mandatory
- In 00's the theme is convergence of IT, telecommunication and consumer electronics

NODES Research Areas



Course Contents

(7.9) Introduction	(9.9) IPv6
(7.9) Basic Mobility Concepts	(9.9) Mobile IP
(7.9) Characteristics of Wireless Communication Systems	(9.9) TCP Enhancements for Wireless Communications
(7.9) UMTS Architecture	(9.9) Location Protocols
(8.9) TCP over Wireless Links	(10.9) Discovery
(8.9) HTTP and Java over Wireless Links	(10.9) Session Protocols
(8.9) Issues in Mobile Computing	(10.9) Instant Messaging and Presence
(8.9) Reference Software Architectures for Mobile Computing	(10.9) Concluding Remarks

Course Material

- lecture notes (slides)
- reading room (selected articles to be provided)
- background material available at <http://www.cs.helsinki.fi/u/kraatika/Courses/>
 - EVC-WIN Summer School July 2002
 - COSC408 at New Zealand Summer 2002

Examination

- So called "home exam"
 - You get four essay titles [there might be alternatives]
 - You write a brief essay (1-2 typed pages – no more than 1000 words) on each topic [in English]
 - you email your essays (pdf, html, word format) after two weeks

My Message to My Students at UHe

- Our working times are flexible
 - you can start early and stop late
 - nobody prevents you working on weekends
- Our mandatory courses are based on experience
- If you want to be at the frontier of mobile computing and communication, we provide the survival kit
 - a lot of studies you do not like to take
 - many courses, the importance of which you understand if you survive
- If you want easy studies, take another section
- We are primarily interested in those who want to be at the frontier