



TEKNILLINEN KORKEAKOULU
TEKNISKA HÖGSKOLAN
HELSINKI UNIVERSITY OF TECHNOLOGY

Xiaolei Xie

identity number: 090183-171J

has been awarded by Helsinki University of Technology the degree

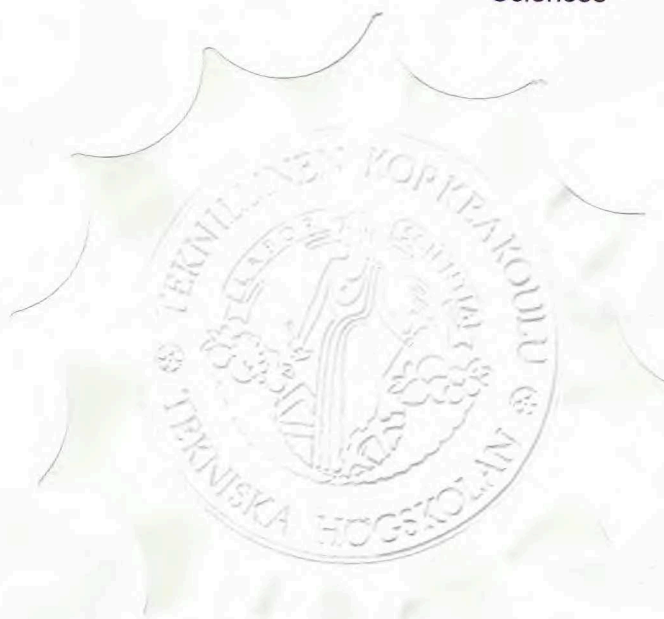
MASTER OF SCIENCE (TECHNOLOGY)

in accordance with the Degree Programme in Computer Science and Engineering

9 June 2008

Rector

Dean
Faculty of Information and Natural
Sciences





Xiaolei Xie

identity number: 090183-171J

student number: 66038R

has been awarded the degree

MASTER OF SCIENCE (TECHNOLOGY)

in the Degree Programme in Computer Science and Engineering

Major Subject

grade very good

Mobile Computing - Services and Security

Master's Thesis

grade excellent

An Authentication and Key Agreement Protocol for the UMTS Network

Master's Thesis Supervisor: Professor Sasu Tarkoma

The graduate has completed the Master's Programme in Mobile Computing - Services and Security included in the Degree Programme in Computer Science and Engineering.

This diploma includes two attachments: the transcript of completed courses lists the studies completed for the degree, and the Diploma Supplement for international use contains information on the university as well as on the studies completed for the degree certificate, their level and status in the education system.



Name: Xiaolei Xie
Identity number: 090183-171J
Student number: 66038R

Degree regulations: Degree Regulations for 2005
Degree: Master of Science (Technology)
Programme: Degree Programme in Computer Science and Engineering
Unit: Master's Programme in Mobile Computing - Services and Security
Major subject: Mobile Computing - Services and Security (T3010)

Accepted as an undergraduate student: 15.5.2006
Accepted as a postgraduate student: -
Terms present (autumn or spring): 6

This transcript of completed courses is a part of the degree certificate issued 9.6.2008 for the above mentioned degree.

COURSES COMPLETED

Code	Course	Credits	Gr	Date	Teacher
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Studies in Major

Mobile Computing - Services and Security

Advanced Studies in Network Services and Applications

T-109.4300	Network Services Business Models	3,0 cr	3	11.6.2007	Sakari Luukkainen
T-110.5100	Laboratory Works in Datacommunications Software	4,0 cr	hyv	9.1.2006	Seppo Äyräväinen
T-110.5116	Computer Networks II - Advanced Features P	4,0 cr	5	11.1.2008	Sasu Tarkoma
T-110.5120	Next Generation Wireless Networks P	4,0 cr	4	14.12.2005	Timo Kiravuo
T-110.6100	Special Assignment in Datacommunications Software P Autumn 2006	5,0 cr	5	31.12.2006	Jukka Manner

Total credits: 20,0 cr
Average grade: 4,37
Grade: Very good

Advanced Studies in Technical Information Security

T-110.4206	Information Security Technology	3,0 cr	3	1.1.2006	Timo Kiravuo
T-110.5190	Seminar on Internetworking P Mobile Communities	4,0 cr	3	30.5.2006	Antti Ylä-Jääski
T-110.5210	Cryptosystems	4,0 cr	5	11.1.2008	Sami Vaarala
T-110.6210	Individual Studies in Information Security P Achieve higher security with risk management	5,0 cr	4	4.1.2006	Teemupekka Virtanen
T-79.5303	Safety critical systems	4,0 cr	5	11.5.2007	Ilkka Herttua, Teemu Tynjälä

Total credits: 20,0 cr
Average grade: 4,05
Grade: Very good

Total credits: 40,0 cr
Average grade: 4,19
Grade: Very good



Name: Xiaolei Xie
Identity number: 090183-171J
Student number: 66038R

Code	Course	Credits	Gr	Date	Teacher
Basic Studies in Computer Science					
Kie-98.7011	Finnish 1A	2,0 cr	3	20.10.2005	Seija Koski
Kie-98.7012	Finnish 1B	2,0 cr	2	9.12.2005	Seija Koski
T-106.5300	Embedded Systems	5,0 cr	3	22.5.2008	Heikki Saikkonen
T-76.3601	Introduction to Software Engineering	5,0 cr	3	17.5.2006	Casper Lassenius
T-76.4115	Software Development Project I	6,0 cr	5	22.3.2007	Jari Vanhanen
Total credits:		20,0 cr			
Average grade:				3,50	
Grade:			Very good		

Methodological Principles (TIK)

T-61.5010	Information visualization P	5,0 cr	3	16.3.2007	Kai Puolamäki
T-79.5103	Computational complexity theory P	5,0 cr	4	16.1.2006	Tomi Janhunen
Total credits:		10,0 cr			
Average grade:				3,50	
Grade:			Very good		

Elective Studies (TIK)

Harj-0.1002	Training (higher university degree)	2,0 cr	hyv	19.3.2007	Antti Ylä-Jääski
Harj-0.1002	Training (higher university degree)	4,0 cr	hyv	11.10.2006	Antti Ylä-Jääski
Kie-98.1100	English Placement Test	3,0 cr	hyv	26.9.2005	Diane Pilkinton-Pihko
T-106.1003	Computer as a Tool	2,0 cr	5	12.10.2005	Aura Paloheimo
T-106.430	Operating Systems	3,0 ocr	4	31.8.2006	Vesa Hirvisalo
T-76.1143	Database Management	5,0 cr	3	16.5.2006	Juha Puustjärvi
Total credits:		20,5 cr			
Average grade:				3,73	
Grade:			Very good		

Master's Thesis (TIK)

T-110.D	Master's Thesis An Authentication and Key Agreement Protocol for the UMTS Network	30,0 cr	5	9.6.2008	Sasu Tarkoma
T-110.K	Maturity Test	0,0 cr	hyv	15.4.2008	Antti Ylä-Jääski
Total credits:		30,0 cr			
Average grade:				5,00	
Grade:			Excellent		

THE TOTAL SCOPE OF THE DEGREE

Total credits:	120,5 cr	
Average grade:		4,17

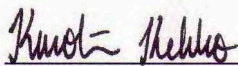
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The scopes of studies are measured in old credits (ocr) or in credits (cr). One old credit indicates an input of approximately 40 hours of work of a student. In credit system the average number of hours demanded by one academic year of studies, 1600 hours, is equivalent to 60 credits.

Grading: pass (hyv), excellent (5), very good (4), good (3), very satisfactory (2) and satisfactory (1). The examination of an official language: good (ht) and satisfactory (tt). The grades for the study entities and the thesis in the pre-doctoral and doctoral degrees are pass (hyv) and pass with distinction (kh).

Average grades are calculated by weighting the course grades according to their credits which are graded: excellent (5), very good (4), good (3), very satisfactory (2) and satisfactory (1). If a course is assessed as pass, it is not included in the average. Decimals are truncated without rounding up.

Espoo, 10 June 2008



Karoliina Kekko



Helsinki University of Technology
IL / Karoliina Kekko
Otakaari 1, P.O.Box 1000, FI-02015 TKK, Finland
+358 9 4511
<http://www.tkk.fi/>