



Agreement on
Dual Degree Program in Computer Science

between

Shanghai Jiaotong University

School of Electronic, Information, and Electrical Engineering (EIEE)

and

Technische Universität Berlin

Faculty of Electrical Engineering and Computer Science (EECS)

October 2007

1 Subject of the agreement and aims

This agreement describes the academic and administrative conditions concerning the realization of the dual degree program. The program supports the exchange of students between Shanghai Jiaotong University (SJTU), School of Electronic, Information, and Electrical Engineering and TU Berlin, Faculty of Electrical Engineering and Computer Science. The aim is to enable students of Computer Science to receive degrees of both universities.

2 Academic conditions

2.1 This agreement applies to

- SJTU students of Computer Science,
 - who successfully completed courses to the extent of 160 Credit Points, (this number may vary slightly each year due to actual regulations of SJTU) within the first three years and a grade point average of at least B- in the Bachelor Program in Computer Science (Appendix 1),
 - and are well-versed in the German language, as demonstrated by TestDaF level 4.
- TUB students of Computer Science,
 - who successfully completed the mandatory courses to the extent of 120 ECTS ("Basic Studies") within the first two years and a grade point average of at least 2.7 in the Bachelor Program in Computer Science (Appendix 2),
 - and are well-versed in the English language, as demonstrated by TOEFL test (a minimum of 90 points in the TOEFL Internet-based Test (TOEFL iBT) is required).

2.2 Selection procedure

Both parties guarantee that participants of the dual degree program will be selected according to their academic, personal, and linguistic qualifications. As the students are selected during their participation in the Bachelor Program but are supposed to enter also the Master Program of both universities, it has to be guaranteed that they fulfill all requirements to be enrolled in the Master Program of both universities after having successfully acquired their Bachelor Degree.

The home university proposes a list of selected students to the host university. The host university is entitled to inspect the list and to confirm chosen students. In case of problems the partners will make consensual regulations via their International Offices.

2.3 Exchange contingent

Up to ten students are to be accepted by the host university. In case of more than ten applicants, mutual regulations will be found.

2.4 Acknowledgement of student's achievements on entering the dual-degree program

On the assumption of fundamental equivalence and based on mutual trust in the academic quality of the host university's curriculum it is agreed that:

- SJTU acknowledges the qualification for university entrance to TUB and the completed two years of studies in the Bachelor Program with at least 120 ECTS as the entry requirement for fourth year's studies at SJTU.
- TUB acknowledges the qualification for university entrance to SJTU and the completed three years of studies in the Bachelor Program with at least 160 Credit Points (this number may vary slightly each year due to actual regulations of SJTU) as the entry requirement for third year's studies (fifth semester) at TUB.

2.5 Curricular conditions

The following paragraphs state the curricular conditions.

2.5.1 The attended courses/lectures at both universities must overlap only slightly.

2.5.2 Students from SJTU

To fulfill the requirements of the Bachelor Program at TUB students have to gain at least 48 ECTS in two semesters. Additionally, a Bachelor Thesis (12 ECTS) has to be submitted. With respect to the Bachelor Program of SJTU students have to take the following courses in the Bachelor Program of TUB:

Fifth Semester (30 ECTS):

MPGI 3: Software Engineering, Part 1 (6 ECTS)

MPGI 4: Practical Program Design (6 ECTS)

TheGI für TI: Theoretical Computer Science for Computer Engineering (6 ECTS)

Modules from Software and/or Communications (Appendix 3) (12 ECTS)

Sixth Semester (30 ECTS)

MPGI 3: Software Engineering, Part 2 (6 ECTS)

TheGI 2: Computability and Complexity (6 ECTS)

Modules from Software and/or Communications (Appendix 3) (6 ECTS)

Bachelor Thesis (12 ECTS)

It is required that in the freely selected modules from the area of Software or Communications (Appendix 3) one seminar is included.

The 48 ECTS are equivalent to 32 Credit Points and are transferred to SJTU. Those 32 Credit Points plus the Bachelor Thesis fulfill the requirements of the Bachelor Program at SJTU so that the students receive a Bachelor Degree from SJTU. Due to this degree and the listed constraints the enrolment in the Master Program at both universities is granted.

In the Master Program (two semesters at TUB) students have to gain at least 60 ECTS during those two semesters. There is a free choice of modules from the Master Pro-

gram of Computer Science that is structured in System Engineering (SE), Dependable Systems (VS), Intelligent Systems (IS), and Communication-Based Systems (KS). (Appendix 4)

After two years of study at TUB, the students return to SJTU in order to complete their studies. The Credit Points gained at TUB are transferred to SJTU. One Credit Point at SJTU is equivalent to 1.5 ECTS. In particular, the Master's Thesis has to be performed at SJTU. To fulfill the requirement of TUB, an extended abstract of the thesis (five pages in German) must be submitted to TUB. TUB professors may attend the thesis defense at SJTU.

2.5.3 Students from TUB

To fulfill the requirements of the Bachelor Program at SJTU students have to gain at least 32 Credit Points in two semesters. Additionally a Bachelor Thesis written in English has to be submitted to both universities. This thesis will be evaluated by a professor from SJTU and a professor from TUB. With respect to the Bachelor Program of TUB students have to take the courses in the Bachelor Program of SJTU as listed in Appendix 5. The 32 Credit Points are equivalent to 48 ECTS and are transferred to TUB. Those 48 ECTS plus 12 ECTS for the Bachelor Thesis fulfill the requirements of the Bachelor Program at TUB so that the students receive a Bachelor Degree from TUB. Due to this degree the enrolment in the Master Program at both universities is granted.

In the Master Program (two semesters at SJTU) students have to gain at least 30 Credit Points during those two semesters. The courses in the Master Program of SJTU have to be taken as listed in Appendix 6

After two years of study at SJTU, the students return to TUB in order to complete their studies. The Credit Points gained at SJTU are transferred to TUB. One Credit Point at SJTU is equivalent to 1.5 ECTS. In particular, the Master's Thesis has to be performed at TUB. To fulfill the requirement of SJTU, a paper based on the Master's Thesis must be published. Additionally, an extended abstract of the thesis (five pages in Chinese) must be submitted to SJTU. Translation help will be provided. SJTU professors may attend the thesis defense at TUB.

All further details are handled by the examination boards (Prüfungsausschüsse) of the universities in question. Each change of the curriculum has to be agreed upon by both universities in writing.

2.6 Examination regulations (Prüfungsordnung)

SJTU students at TUB: During the studies at TUB, the examination regulations (Prüfungsordnung) of TUB are valid in the current version.

TUB students at SJTU: During the studies at SJTU, the examination regulations of SJTU are valid in the current version.

To be able to transfer the Credit Points respectively the ECTS earned during the Master Program, both universities will hand out a transcript of records in English to the exchange students. The Transcript of Records is an official inventory of the courses taken, the achieved

number of Credit Points respectively ECTS, and national grades earned by the students throughout their stay in the host university.

2.7 Awarding the degrees

SJTU students at TUB: After successful completion of the Bachelor Program at TUB, students of SJTU receive a Bachelor Degree, B.Sc., from SJTU.

TUB students at SJTU: After successful completion of the Bachelor Program at SJTU, students of TUB receive a Bachelor Degree, B.Sc., from TUB.

After successful completion of the complete program at both universities, the students receive the Master Degrees of both universities, i.e. the M. Sc. of SJTU and the M. Sc. of TUB.

3. Financial arrangements

Participants of the dual degree program are responsible for their own travel and living expenses during the exchange, if there is no third party funding. The home as well as the host institution will, however, try to get financial support to defray all or part of those expenses. The host university will arrange for accommodations in a student dormitory, if wanted and possible.

Students participating in this dual degree program will pay their normal tuition and registration fees at their home universities. During the term of the agreement the host universities agree to waive all tuition fees for incoming students visiting under this agreement.

Technische Universität Berlin

Date: 15.10.2007

Professor Dr. Kurt Kutzler

President

Shanghai Jiao Tong University

Date: 15.10.2007

Professor Dr. Yin Yie

Vice President

Appendix 1

Bachelor Program Computer Science, SJTU

Humanities not listed

20.5	Freshmen	19	21	Sophomore	15.5																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Calculus I (6)</td></tr> <tr><td>Linear Algebra (2.5)</td></tr> <tr><td>Chemistry (2)</td></tr> <tr><td>English I (4)</td></tr> <tr><td>Program Design (4)</td></tr> <tr><td>Introduction to Biotechnology (2)</td></tr> </table>	Calculus I (6)	Linear Algebra (2.5)	Chemistry (2)	English I (4)	Program Design (4)	Introduction to Biotechnology (2)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Calculus II (4)</td></tr> <tr><td>Probability and Statistics (2.5)</td></tr> <tr><td>Physics I (4)</td></tr> <tr><td>Experiments in Physics I (1.5)</td></tr> <tr><td>English II (4)</td></tr> <tr><td>Discrete Mathematics (3)</td></tr> </table>	Calculus II (4)	Probability and Statistics (2.5)	Physics I (4)	Experiments in Physics I (1.5)	English II (4)	Discrete Mathematics (3)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Physics II (4)</td></tr> <tr><td>Experiments in Physics II (1.5)</td></tr> <tr><td>Complex Funct. and Integral Transf. (2)</td></tr> <tr><td>Data Structures and Algorithms (3)</td></tr> <tr><td>Basic Circuit Theory + Exp. (4 +2)</td></tr> <tr><td>Digital Electronics + Exp. (3 + 1.5)</td></tr> <tr><td>English III (4)</td></tr> </table>	Physics II (4)	Experiments in Physics II (1.5)	Complex Funct. and Integral Transf. (2)	Data Structures and Algorithms (3)	Basic Circuit Theory + Exp. (4 +2)	Digital Electronics + Exp. (3 + 1.5)	English III (4)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Analog Electronics + Exp. (3 + 1.5)</td></tr> <tr><td>Signals and Systems (3)</td></tr> <tr><td>Microcomp. and Interfaces + Exp. (3 + 1)</td></tr> <tr><td>English IV (4)</td></tr> </table>	Analog Electronics + Exp. (3 + 1.5)	Signals and Systems (3)	Microcomp. and Interfaces + Exp. (3 + 1)	English IV (4)		
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Appendix 2

Bachelor Program Computer Science, TUB

ECTS	Technical CS	Methods and Practice CS		Theory CS	Mathematics
1. Sem. 29	TechGI 1 Digital Systems (6)	MPGI 1 Algorithmic and Functional Solution of Discrete Problems (9)		TheGI 1 Foundations and Algebraic Structures (8)	Linear Algebra for Engineers (6)
2. Sem. 29	TechGI 2 Computer Organization (6)	MPGI 2 Data Structures and Algorithms Imperative Style (9)		TheGI 2 Computability and Complexity (6)	Calculus I for Engineers (8)
3. Sem. 32	TechGI 3 System Programming (6)	MPGI 3 Software Engineering Part 1, Theory (6)	MPGI 4 Practical Program Development (6)	TheGI 3 Logic and Calculi (6)	Calculus II for Engineers (8) LP
4. Sem. 30	TechGI 4 Computer Networks and Distributed Systems (6)	MPGI 3 Software Engineering Part 2, Project (6)	MPGI 5 Database Systems (6)	TheGI 4 Specification und Semantics (6)	Stochastics for Computer Scientists (6)
5. Sem. 30	Major Selection CS: Modules from Software Engineering and Communications (21-24)		Minor Selection e.g. from Mathematics, EE, etc. (12 -15)		Foundations of Management (6)
6. Sem. 30			Bachelor Thesis 12		Social Aspects of Computer Science (6)

Σ 180 ECTS

Appendix 3

Major Selection for Bachelor Program Computer Science, TUB

Due to the technical development of the field the listed Modules are subject to yearly change. The most actual version can always be found (in German) at the following internet address:

<http://iv.tu-berlin.de/comm/ak/Module/INF/Module%20Bachelor%20Informatik/BachelorINFKurz.pdf>

Software Technology

Module ID	Module Name	ECTS
AOT	Agent-Oriented Technologies	6
SOA	Service Oriented Architectures	9
CG/CV	Computer Graphics and Computer Vision	6
DBS2	Data Base Systems (Advanced Topics)	6
INFM	Information Modeling (Advanced Topics)	6
IDA	Intelligent Data Analysis	6
PJIDA	Project Intelligent Data Analysis	9
KI	Artificial Intelligence: Fundamentals and Applications	6
EES	Embedded Real-Time Systems	6
PJROB	Project Robotics	9
OOS	Object Oriented Software Development	6
PXSWT	Software Engineering Practice	9
PQS	Software Quality Assurance Practice	6
ESA	Introduction to Systems Analysis	6
KPSYS	Project Systems Analysis	6
VS	Visual Programming Languages – Practice	9
VSSE	Visual Programming Languages – Practice Seminar	12
FM&KP	Formal Modeling and Compositionality of Process Oriented Systems	6
FM&KPSE	Formal Modeling and Compositionality of Process Oriented Systems Seminar	9

Communication Technology

Module ID	Module Name	ECTS
PJCIT	Project Complex and Distributed IT Systems with Seminar	9
SuK	Semantics and Calculi	9
MuO	Models and Ontologies	9
MuEVS	Modeling and Development of Open Distributed Systems	12
PJKBS	Project Operating Systems	6
KN	Communication Networks	6
PRKN	Communication Networks - Practical Realization	9

Appendix 4

Major Selection for Master Program Computer Science, TUB

Due to the technical development of the field the listed Modules are subject to yearly change. The most actual version can always be found (in German) at the following internet address:

<http://iv.tu-berlin.de/comm/ak/Module/INF/Module%20Master%20Informatik/MasterINFKurz.pdf>

System Engineering (SE)

Module ID	Module Name	LP
KBS6	Advanced Project Operating Systems	12
IS3	Computer Architecture	12
PES1	Software Engineering for Embedded Systems	6
PES1b	Software Engineering for Embedded Systems	9
PES2	Semantics and Analysis of Software Systems	6
PES2b	Semantics and Analysis of Software Systems	9
PES3	Design of Embedded Systems	9
REA	Computer Systems	6
RT1	Design of Digital Systems	12
RT2	Design Automation for Digital Systems	9
RT3	VHDL Project (FPGA)	9
SWT2	Practical Software Engineering	15
SWT4	Quality of the Software Development Process	9
SWT6	Advanced Developments in the Field of Software Engineering	9
ÜBB1/PES4	Compiler Construction I	6
ÜBB2	Compiler Construction II	6
ÜBB3	Functional Programming	6
ÜBB4	Constraint Programming	6
ÜBB5	Development of Correct Programs	6
ÜBB6	Project Compiler Construction	9
ÜBB7	Practical Design of Programming Languages	9

Dependable Systems (VS)

Module ID	Module Name	LP
MTV1	Algebraic Process Calculi	6
MTV2	Distributed Algorithms	6
MTV3	Temporal Logic for Software Engineers	9
MTV4	Security Protocols	9
MTV5	The Software Horror Picture Show	4
PDV2	Programming and Modeling of Real-Time Systems	6
SWT3	Software Security	12
TFS2B	Project Visual Programming Languages B	12
TFS4A	Graph and Model Transformations A	6
TFS4B	Graph and Model Transformations B	9
TFS5A	Component Based Modeling and Correctness A	6
TFS5B	Component Based Modeling and Correctness B	9
TFS6A	Category Theory in Mathematics and Computer Science A	6
TFS6B	Category Theory in Mathematics and Computer Science B	9
TFS7	Advanced Topics in Theoretical Computer Science	6
TFS8	Seminars in Theoretical Computer Science	6
TKN7	Communication Technologies	6

Intelligent Systems (IS)

Module ID	Module Name	LP
AOT3	Interacting Systems	6
CG1	Generative Computer Graphics	6
CG2	Modeling in Computer Graphics	6
CG3	Medical Applications of Computer Graphics	9
CG4a	Computer Graphics Project and Seminar	9
CG4b	Computer Graphics Project and Seminars	12
CIS3	Project Information Systems	9
CIS4	Heterogeneous Distributed Information Systems	6
CIS5	Technical Information Systems	6
CV1	Photogrammetric Computer Vision	8
CV2	Digital Image Processing	6
CV3	Image Analysis	6
CV4	Optical Remote Sensing	6
CV5	Microwaves and Radar for Remote Sensing	6
CV6	Seminar Hot Topics in Computer Vision	3
CV7	Project Hot Topics in Computer Vision	6
CV8	Seminar Hot Topics in Image Analysis	3
CV9	Project Hot Topics in Image Analysis	6
CV10	Geoinformation Systems	6
CV11	Stereo Analysis and 3D Image Synthesis in Video Communication Systems	4
FLP4	IT Systems in Developing Countries	12
IG5	Economics of IT Systems	6
NI1	Introduction to Neural Information Processing	6
NI2	Neural Information Processing	6
NI3	Models for Information Processing in the Brain	6
NI4	Neural Networks I	9
NI5	Neural Networks II	9
NI6	Bioinformatics (not in WS 06/07)	6
NI7	Actual Developments in Neuroinformatics (not in WS 06/07)	6
NI8	Image Processing in Medical Applications and in Neurobiology	6
NI9	Introduction to Artificial Intelligence	6
PDV3	Robotics I	6
PDV4	Robotics II	9
PDV5	Robotics Project and Seminar	9
SYS2	Systems Analysis	9
SYS3	Special Business Information Systems	6
SYS4	Systems Analysis Project	12
SYS5	Computer Based Systems Analysis	6
SYS6	Enterprise Architecture	6
SYS7	Knowledge Networks and Semantic Technologies	6
SYS8	Net Business Tools	6
SYS9	Business Information Systems Practical Exercises	6

Communication-Based Systems (KS)

Module ID	Module Name	LP
AV1	Next Generation Networks	9
AV2	Next Generation Networks Project	6
CIT2	Distributed Systems	6
CIT3	Architectures of Distributed Systems	9
CIT4	Operating Complex IT Systems	9
CIT5	Complex IT Systems Project	12
ETS1	System and Test Design	9
ETS2	Techniques for Analysis and Assessment of Systems	6
OKS1	Introduction to Open Communication Systems	6
OKS2	Open Communication Systems	9
OKS3	Open Communication Systems Project	6
TKN2	Communication Networks Lab	6
TKN3	Protocol Functions Lab	6
TKN4	Performance Evaluation	6
TKN5	Simulation	6
TKN6	Stochastic Performance Evaluation	6
TKN7	Communication Technologies	6
TKN8	Advanced Communication Technologies	9
TKN9	Communication Networks Project	6
TKN10	Communication Networks Advanced Lab	9

Appendix 5

Major Selection for Bachelor Program Computer Science, SJTU

Subject	Credit Points (CP)
Database Systems	3
Natural Language Understanding	3
Artificial Intelligence	3
Information Gathering Based on Internet	3
Object-oriented Analysis and Design	3
Applied Algebra	3
Digital Image Processing	2
System on Programmable Chip (SOPC) Lab	3
Embedded System Lab	3
Communication Lab	3
Advanced Selective	3
Total	32

Appendix 6

Major Selection for Master Program Computer Science, SJTU

Subject	Credit Points (CP)
Compilers	3
Bio Informatics	3
Cryptography Engineering	3
Mobile and Wireless Networking	3
Computer Graphics	3
Wireless Communication and Sensor Networks	2
Advanced selective	6
Chinese Language	7
Total	30