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Hierbij ontvangt u 15 exemplaren van het eindrapport van de visitatie Informatica ow 2013 (cluster).

Wij vertrouwen erop hierbij aan onze verplichtingen te hebben voldaan.

Met vriendelijke groet,
i/o

drs. S. Looijenga
directeur

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CONTENTS

Report on the master's programme Computer Science of the Delft University of Technology 5

Administrative data regarding the programme 5
Administrative data regarding the institution 5
Quantitative data regarding the programme 5
Composition of the assessment committee 5
Working method of the assessment committee 6
Summary judgement 9
Description of the standards from the Assessment framework for limited programme assessments 12

Appendices 23

Appendix 1: Curricula Vitae of the members of the assessment committee 25
Appendix 2: Domain-specific framework of reference 27
Appendix 3: Intended learning outcomes 31
Appendix 4: Overview of the curriculum. 33
Appendix 5: Quantitative data regarding the programme 35
Appendix 6: Programme of the site visit 39
Appendix 7: Theses and documents studied by the committee 43
Appendix 8: Declarations of independence 45

This report was finalised on 24 August 2013.

Report on the master's programme Computer Science of Delft University of Technology

This report takes the NVAO's Assessment Framework for Limited Programme Assessments as a starting point.

Administrative data regarding the programme

Master's programme Computer Science

Name of the programme:	Computer Science
CROHO number:	60300
Level of the programme:	master's
Orientation of the programme:	academic
Number of credits:	120 EC
Specialisations or tracks:	ST, IA, MKE, BI
Location(s):	EEMCS Building, Mekelweg 4, Delft, The Netherlands
Mode(s) of study:	full time
Expiration of accreditation:	31 December 2014

The visit of the assessment committee Computer Science to the Faculty of Electrical Engineering, Mathematics and Computer Science of Delft University of Technology took place on 16 and 17 May 2013.

Administrative data regarding the institution

Name of the institution:	Delft University of Technology
Status of the institution:	publicly funded institution
Result institutional quality assurance assessment:	positive

Quantitative data regarding the programme

The required quantitative data regarding the programme are included in Appendix 5.

Composition of the assessment committee

The committee that assessed the master's programme Computer Science consisted of:

- Prof. dr. J. Paredaens (chairman), retired professor in Database Research, Antwerp University;
- Prof. dr. ir. K. De Bosschere (member), professor in Computer Science, Ghent University;
- Prof. dr. S. Mullender (member), Director of the Network Systems Laboratory at Bell Labs, Antwerp and professor Systems Research, University of Twente;
- Prof. dr. ir. W. Van Petegem (member), associate professor and Director Teaching and Learning, KU Leuven;
- R. Verbij Bsc (member), student Computer Science, University of Twente.

The committee was supported by E. Kozlowska MA, QANU staff member and coordinator of the Computer Science assessment cluster 2013, who acted as secretary.

The Delft University of Technology board and the Accreditation Organisation of the Netherlands and Flanders (NVAO) agreed to the composition of the assessment committee. Appendix 1 contains the curricula vitae of the members of the committee. All members of the committee and the secretary signed a declaration of independence as required by the NVAO protocol to ensure that they judge without bias, personal preference or personal interest, and the judgement is made without undue influence from the institute, the programme or other stakeholders (see Appendix 8).

Working method of the assessment committee

The assessment of the master's programme Computer Science (CS) was part of an assessment cluster. In total, the committee assessed 26 programmes from ten universities: Open Universiteit, University of Groningen, Eindhoven University of Technology, Utrecht University, University of Amsterdam/VU University Amsterdam, Radboud University Nijmegen, Leiden University and University of Twente.

The assessment committee Computer Science 2013 consisted of 10 members:

- Prof. dr. J. Paredaens (chairman), retired professor in Database Research, Antwerp University;
- Prof. dr. L. Bijlsma (member), professor in Education and Software Construction and Dean of the Faculty of Computer Science, Open Universiteit;
- Prof. dr .ir. B. Preneel (member), professor in Information Security, KU Leuven;
- Prof. dr. J. van den Herik (member), professor in Computer Science, Tilburg University;
- Prof. dr. ir. K. De Bosschere (member), professor in Computer Science, Ghent University;
- Prof. dr. S. Mauw (member), professor in Security and Trust of Software Systems, University of Luxembourg;
- Prof. dr. S. Mullender (member), Director of the Network Systems Laboratory at Bell Labs, Antwerp and professor Systems Research, University of Twente;
- Prof. dr .ir. W. Van Petegem (member), associate professor and Director Teaching and Learning, KU Leuven;
- P. Boot Bsc (member), student Computer Science, Utrecht University;
- R. Verbij Bsc (member), student Computer Science, University of Twente.

Preparation
The committee held a preliminary meeting on 26 April 2013. During this meeting the committee was instructed about the accreditation framework and the programme of the upcoming assessments. A vice-chair for each visit was appointed and the Domain-specific Framework for Computer Science was set (see Appendix 2).
To prepare the contents of the site visits, the coordinator first checked the quality and completeness of the Critical Reflection Reports prepared by the programmes. After establishing that the Reports met the demands, they were forwarded to the participating committee members. The committee members read the reports and formulated questions on their contents. The coordinator collected the questions and arranged them according to topic.

As well as the Critical Reflection Report, the committee members read a total of fifteen theses for the master's programme. The theses were randomly chosen from a list of graduates of the last two completed academic years within a range of grades.

Site visit
A preliminary programme of the site visit was made by the coordinator and adapted after consultation of the committee chairman and the programme coordinator of Delft University of Technology. The timetable for the visit in Delft is included as Appendix 6.

Prior to the site visit the committee asked the programmes to select representative interview partners. During the site visit meetings were held with panels representing the faculty management, the programme management, alumni, the programme committee and the Board of Examiners. Meetings were also held with representatives of the students and teaching staff. Well in advance of the visit, the committee approved a list of the selected interview partners.

During the site visit the committee examined material it had requested; an overview of this material is given in Appendix 7. The committee gave students and lecturers the opportunity – outside the set interviews – to speak informally to the committee during a consultation hour. No requests were received for this option.

The committee used the final part of the visit for an internal meeting to discuss the findings. The visit was concluded with a public oral presentation of the preliminary impressions and general observations by the chair of the committee.

Report
Based on the committee's findings, the coordinator prepared a draft report. This report was presented to the committee members involved in the site visit. After receiving approval, the draft report was sent to the faculty with the request to check it for factual inaccuracies. The comments received from the programme were discussed with the committee chairman. The final version of the report was sent to the committee members for a final check. Subsequently the definitive report was approved and sent to Delft University of Technology.

Decision rules
In accordance with the NVAO's Assessment Framework for Limited Programme Assessments (as of 6 December 2010), the committee used the following definitions for the assessment of both the standards and the programme as a whole.

Generic quality
The quality that can reasonably be expected in an international perspective from a higher education bachelor's or master's programme.

Unsatisfactory
The programme does not meet the current generic quality standards and shows serious shortcomings in several areas.

Satisfactory
The programme meets the current generic quality standards and shows an acceptable level across its entire spectrum.

Good
The programme systematically surpasses the current generic quality standards across its entire spectrum.

Excellent
The programme systematically well surpasses the current generic quality standards across its entire spectrum and is regarded as an (inter)national example.

The default assessment is 'satisfactory', i.e. the programme complies adequately with the criteria.

Summary judgement

This report reflects the findings and considerations of the committee on the master's programme in Computer Science of Delft University of Technology. The judgement of the committee is based on information provided in the Critical Reflection Report and the selected theses, additional documentation and interviews conducted during the site visit. The committee noted both positive aspects and some aspects which could be improved. Taking those aspects into consideration, the committee concluded that the master's programme Computer Science of Delft University of Technology fulfils the requirements of the criteria set by NVAO which are the conditions for accreditation.

Standard 1: Intended learning outcomes
The committee assesses Standard 1 of the master's programme Computer Science as **satisfactory.**

The intended learning outcomes of the master programme aim at deepening and sharpening the academic and professional qualifications obtained at the bachelor's level (e.g. bachelor of Computer Science). The programme aims to increase students' professional capabilities for working independently and being able to design and implement complex systems. It provides a specialisation in a particular topic within the field.

According to the committee, the intended learning outcomes reflect the Domain-specific Reference Framework. The Committee also concluded that the level and orientation of the programme is not always visible in the intended learning outcomes, but do emerge in some courses of the programme. The committee supports the initiative of the Faculty to make the objectives more CS-specific. The programme thus meets the criteria set for its curriculum by the professional field and the discipline.

Standard 2: Teaching-Learning environment
The committee assesses Standard 2 of the master's programme Computer Science as **good.**

In 2006, the Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS) offered two master's programmes related to Computer Science: the master's programme in Media and Knowledge Engineering and the master's programme in Computer Science. In 2011, it was decided to merge the two master's programmes into a single (Msc) programme in Computer Science, with four tracks: Software Technology (ST), Information Architecture (IA), Media and Knowledge Engineering (MKE) and Bioinformatics (BI).

The committee is very pleased with the teaching personnel, in both quantitative and qualitative terms. There is a policy in place to promote the quality of the lecturers. The focus on BKO and EWI-KO is positive and indicates that the quality of teaching is important for the programme. When considering promotions of the teaching personnel, serious consideration is given to the quality of the education provided.

The committee approves the design of the teaching; the links between the different parts of the programme are clear, and they build on each other. The committee greatly appreciates the use of a wide range of teaching forms and tools, especially the web lectures, *collegerama* and the *clickers*.

The committee concludes that the completion rates are low, mainly because of delay during the Thesis Project. Appropriate solutions are being implemented to reduce this delay. The committee is of the opinion that these solutions will contribute to improvement of the completion rates and wishes to advise the programme to manage this process more adequately.

The committee concludes that the programme stimulates excellence by offering additional opportunities for master students. Delft University offers an Honours Programme for excellent students, consisting of 30 EC. The honours programme offers students the opportunity to explore academic research areas; ideally the final paper of the participating student results in a scientific publication. The programme utilises international scientific study material, and 95% of its staff has a doctor's degree.

The committee is of the opinion that the programme is well organised and that the students are well prepared for obtaining their final qualifications. It is impressed by the way in which the programme is continuously focussing on quality improvement.

Standard 3: Assessment and achieved learning outcomes
The committee assesses Standard 3 of the master's programme Computer Science as **good.**

The committee has carefully examined the quality of the assessments and has concluded that it is sufficient throughout the master's programme. The programme uses a variety of assessment methods that fit the learning goals of the courses. Setting up a good quality assurance system for monitoring the programme is in progress. The committee appreciates the steps that the Board of Examiners is taking and greatly values the *Assess-the-assessment*-policy.

The committee has evaluated a representative set of master theses and has concluded that the master's students acquire an adequate final level by the end of the master's programme Computer Science. Moreover, the committee was impressed by the scientific quality of the theses it evaluated. The committee appreciates that the programme is working on improvement of the thesis assessment forms.

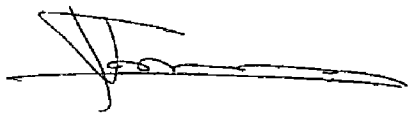
In the committee's judgement, the master's programme Computer Science of the Delft University of Technology fulfils the criteria for accreditation. It has noted many positive aspects and suggested several points for improvement. It greatly appreciates the learning environment offered by the programme to the students, enabling them to achieve a high level of proficiency.

The committee assesses the standards from the Assessment framework for limited programme assessments in the following way:

Standard 1: Intended learning outcomes	**satisfactory**
Standard 2: Teaching-learning environment	**good**
Standard 3: Assessment and achieved learning outcomes	**good**
General conclusion	**good**

The chairman and the secretary of the committee hereby declare that all members of the committee have studied this report and that they agree with the judgements laid down in the report. They confirm that the assessment has been conducted in accordance with the demands relating to independence.

Date: 24 August 2013



Prof.dr. J. Paredaens
Chairman

E. Kozlowska MA
Secretary

Description of the standards from the Assessment framework for limited programme assessments

Standard 1: Intended learning outcomes

The intended learning outcomes of the programme have been concretised with regard to content, level and orientation; they meet international requirements.

Explanation:
As for level and orientation (bachelor's or master's; professional or academic), the intended learning outcomes fit into the Dutch qualifications framework. In addition, they tie in with the international perspective of the requirements currently set by the professional field and the discipline with regard to the contents of the programme.

Findings

This standard deals with the profile and orientation of the programme. The Domain-specific Reference Framework and the intended learning outcomes of the master's programme of Computer Science.

1.1 Profile

In 2006, the Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS) offered two master's programmes related to Computer Science: the master's programme in Media and Knowledge Engineering, with tracks in Media and Knowledge Engineering (MKE) and Bioinformatics (BI) and the master's programme in Computer Science, with tracks in Software Technology (ST) and Information Architecture (IA). In 2011, it was decided to merge the two master's programmes into a single "master's programme" in Computer Science, with four tracks, ST, IA, MKE and BI.

The master's programme in Computer Science is based upon the Domain-specific Reference Framework (hereafter: the Framework, Appendix 2). The Framework defines general learning outcomes according to three goals established in the Dublin descriptors. The Critical Reflection Report states that the master's programme in Computer Science at Delft University aims to fulfil the requirements of the 3TU consortium, which can be mapped into these three goals (see Appendix 2).

1.2 Level and orientation

The intended learning outcomes and competences for the master's programme of Computer Science are derived from the academic criteria of Meijers et. al (2005), also known as the 3TU criteria. An overview of how the master's programme contributes to the learning objectives and 3TU criteria is provided in Appendix 2.

The intended learning outcomes of the master programme aim at deepening and sharpening the academic and professional qualifications obtained at the bachelor's level (e.g. Bachelor of Computer Science). The programme aims to increase students' professional capabilities for working independently and being able to design and implement complex systems. It provides a specialisation in a particular topic within the field.
The intended learning outcomes of the programme are listed in Appendix 3.

The programme has an academic orientation. As stated in the Critical Reflection Report, the faculty expects graduates of the Masters' degree programme to be able to appreciate the current state of knowledge, in addition to being prepared to participate in research projects and contribute to advancing the state of knowledge.Students are encouraged to participate in

CS programmes outside the Netherlands or to take part in the Athens programme. During the visit, the committee concluded that there are only a few students who take this opportunity. The committee also noticed that de master's programme has not been compared with international Computer Science programmes.

Considerations

The committee concluded that the academic and professional level of intended learning outcomes of the master's programme is according to international standards. The necessary competences are represented in the intended learning outcomes.

Even though the committee finds the profiling and academic orientation adequate, it feels that the intended learning outcomes are in need of sharpening. To further develop and specify its profile and intended learning outcomes, the committee advises the programme to make an international benchmark with comparable programmes and define the unique selling point of the master's programme of Computer Science at Delft University of Technology.

Conclusion

Master's programme Computer Science: the committee assesses Standard 1 as **satisfactory.**

Standard 2: Teaching-learning environment

The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes.

Explanation:
The contents and structure of the curriculum enable the students admitted to achieve the intended learning outcomes. The quality of the staff and of the programme-specific services and facilities is essential to that end. Curriculum, staff, services and facilities constitute a coherent teaching-learning environment for the students.

Findings

In this Standard the design and the coherence of the curriculum are examined (2.1). Subsequent paragraphs discuss the scientific orientation (2.2), study load, guidance and rates (2.3) and the composition of the academic staff (2.4). Finally, the programme-oriented internal quality assurance, which includes descriptions of the measures for improvement implemented as a result of the previous visit (2.5) are dealt with.

2.1 Programme and coherence of the curriculum

Each track of the Computer Science programme has the following structure: a common core, specialisation courses, free elective and homologation courses and a Thesis Project.

The common core consists of a set of courses that provide an advanced introduction to the field of the specific master's track. After completing these courses, master's students take several courses for their chosen specialisations within the track. Each track offers about 20 specialisation courses. The set of specialisation courses may be complemented by courses from other specialisations within the same master's programme, as well as by courses from other master's programmes offered by EEMCS. The free elective courses may come from other disciplines, possibly offered by other faculties or universities (e.g. international exchange). A limited number of study credits (EC) may be earned through bachelor's courses, in order to remediate deficiencies (homologation). Students consult with the coordinator and thesis supervisor to draw up their individual course programmes, which must be submitted for approval to the Board of Examiners.

2.1.1 Media and Knowledge Engineering Track

Media and Knowledge Engineering (MKE) focuses on the design of the tools and applications at the core of data access and processing. Media and knowledge engineers are indispensable for the design of applications. Examples include medical visualisation to improve the production and fit of prostheses, the development of algorithms to improve hearing aids so that users are better able to comprehend speech and the design of intelligent systems that support negotiation processes. The track in MKE educates engineers who are able to design and build intelligent systems for information and knowledge processing and who are able to design, realise and test properly working intelligent user interfaces.

The master's track in MKE has three specialisations: Computer Graphics, Interactive Intelligence and Information Processing.

2.1.2 Bioinformatics Track

In the track in Bioinformatics (BI), students learn how to design and develop computational algorithms to interpret genomic data, using concepts from mathematics and computer science, as well as from molecular biology and chemistry. The methodologies generated have applications in medicine (diagnosis, treatment, pharmacology), as well as in other areas of the life sciences, ranging from crop science, biotechnology and biochemical manufacturing to

more fundamental research. The primary focus of the Delft-Leiden track in Bioinformatics is on data analysis and modelling, both of which are used to address such issues as data capturing, data warehousing and data mining. These have become major issues for life scientists, due to the explosive growth of quantitative data in biology. Bioinformatics offers a new synthetic approach to the formulation of hypotheses and the solution of problems in biology and biochemistry, which stands in marked contrast to the classical reductionist approach. The challenges encountered have also made bioinformatics vitally important to the identification of new computer-scientific principles and the development of new types of algorithms.

2.1.3 Software Technology Track

The Software Technology track focuses on designing software for technical systems. Research topics range from communication protocols (which allow computers to communicate), and complex algorithms to work on parallel or distributed systems and logistic algorithms for practical planning problems. The track teaches students how complex software systems should be specified, designed, implemented and verified or tested by providing in-depth knowledge on relevant elements.

The track has five specialisations: Software Engineering; Parallel and Distributed Systems; Embedded Software; Algorithmics; and Web Information Systems

2.1.4 Information Architecture Track

Information Architecture (IA) is a multi-disciplinary master's track. It is a collaborative programme of the Faculty of Electrical Engineering, Mathematics & Computer Science (EEMCS) and the Faculty of Technology, Policy and Management (TPM). The IA programme combines aspects from computer science and from management sciences, addressing the problem of concurrently designing and engineering enterprises and their supporting ICT applications. It focuses on aligning the needs of the organisation with the engineering opportunities and solutions offered by novel ICT solutions. An information architect is a professional who bridges the gap between business and ICT.

A more detailed composition of the four tracks is given in Appendix 3.

Each course is concluded with an exam or with a report and oral presentation at the end of the teaching period. Resits are organised at the end of the next period (the resit for the fourth period precedes the start of the second year). A description of the assessment policies is given in Standard 3.

The master's programme concludes with a Thesis Project of 45 EC. The quality of the Theses is assessed by researchers of the Faculty. The committee was impressed by the quality of some theses it evaluated.

Besides the (above described) master's programme of 120 EC, the Faculty offers two additional tracks. First, the Honours Programme offers excellent students the opportunity to invest more time in broadening their horizon, develop their talents and participate in scientific research. Second, students who complete the corresponding requirements can obtain additional annotations for 'Technology in Sustainable Development' or 'Entrepreneurship' on their master's degree certificate.

The didactical concept underlying the master's programme is based on the following teaching principles: first, the programme has a cumulative structure, introducing students to learning

materials that are suited with their prior knowledge, and it is challenging and satisfying to the students. Second, the programme stimulates goal-driven learning. To do so, the master's programme offers a variety of teaching methods: lectures, practical work (working on programming assignments and practical exercises under the supervision of a student assistant), seminars, the master's programme Thesis Project and self-study (unsupervised learning activities). The committee approves the design of the teaching; the links between the different parts of the programme are clear, and they build on each other. The committee greatly appreciates the use of a wide range of teaching forms and tools, especially the web lectures, *collegerama* and the *clickers*.

The electronic learning environment *Blackboard* is used for information exchange and communication between teachers and students. Through *Blackboard*, students can enrol in courses they intend to follow and gain access to relevant information.

2.2 Scientific level and orientation

The programme wishes to stimulate excellence by offering additional opportunities for master students. TU Delft offers an Honours Programme for excellent students, consisting of 30 EC. The honours programme offers students the opportunity to explore academic research areas; ideally the final paper of the participating student results in a scientific publication.

The programme states that it utilises international scientific study material, and 95% of its staff has a doctor's degree.

The Critical Reflection Report underlines the scientific orientation of the master's programme by the fact that roughly 25 percent of all thesis projects ultimately result in submissions to scientific publications. Although the Critical Reflection Report does not mention the number of accepted articles, the committee is of the opinion that de master theses of the students are of a high academic level and is positive about the involvement of master students in research programmes by staff members of the Faculty. About 10 percent of the master's students enter PhD programmes in the Netherlands or abroad, see Table 6 in Appendix 5.

The committee is of the opinion that the development of academic research and writing skills is adequately addressed within the programme.

2.3 Study load, guidance and rates

The master's programme is divided into two years, each consisting of four periods. The average workload for a period is 15 EC, and the default size of the courses is 5 EC. At the start of the programme, students compile individual study programmes containing the courses they will attend. To help ensure the feasibility of their individual study programmes (ISP), students are required to discuss these plans with their track coordinators, who must also approve them. Most of the compulsory courses are scheduled in the first semester. Specialisation courses are distributed evenly over the four periods.

The committee discussed the feasibility and the study load of the programme during the site visit in Delft with master students. Based on this information the committee concludes that the master's programme is challenging from time to time, but no specific barrier courses have been identified by the committee.

The committee is concerned about the fact that in a considerable number of cases, the Thesis Project lasts longer than (the nominal) nine months. Another related concern is the fact that the average study period is longer than two years; the average length of study (by origin of

intake into the master's programme Computer Science) for graduates of Delft University of Technology is 28 months in 2008, 33 months in 2009 and 39 months in 2010. Only 50 percent of the Dutch students complete their study after three years. To prevent delays, a number of measures have been implemented, and more are planned. To compel students to finish their courses before starting the thesis assignment, the Thesis Entrance Permit (TEP) has been introduced. Students who have accumulated at least 63 EC of the required course credits (75 EC) are allowed to request the TEP. The daily supervisor of the Thesis Project will check the TEP at the beginning of the project.

One point that still deserves attention is the intake of female and foreign students. In the committee's opinion, the programme has not entirely succeeded in attracting sufficient numbers of female students for the master's programme. In discussions it was emphasised that the programme is definitely addressing this issue with the "model in one day" initiative. The sole female alumna present had mixed feelings about this. The committee believes that this must remain a constant focus of attention and encourages the programme in its attempts to attract this target group. Regarding foreign students, the programme employs strict selection criteria and cannot make any scholarships available. The committee advises the programme to continue working on the point of attracting more female and foreign students and advises to perhaps draw inspiration from foreign examples of similar programmes.

2.4 Composition of the academic staff

During the site visit the committee has recognised that the teaching staff of the master's programme Computer Science is both qualified and committed. The teaching staff consists of 47 employees. The committee ascertained that there is currently an acceptable staff: student ratio of 1:13 in the master's programme. In addition, it understood from students during the side visit that lecturers are easily accessible and approachable.

Most of the teaching in the master's programme in Computer Science is provided by staff members from the Department of Intelligent Systems and the Department of Software and Computer Technology. Courses on Mathematics are provided by staff members from the Department of Applied Mathematics, and the course on Methodology of Science and Engineering is provided by the Faculty of Technology, Policy and Management.

In principle, there is an equal division between teaching and research: a lecturer devotes 50% of his time to each. Discussions with the lecturers revealed that the situation is different in practice; this topic can be addressed easily and is a recurring element in the annual performance reviews.

The programme supports the continued professionalisation of its lecturers. New lecturers obtain the Basic University Teaching Certificate (BKO), and experienced ones obtain the Faculty Teaching Qualification (EWI-KO). Even after obtaining their BKO or EWI-KO, lecturers participate in the faculty's Life-Long Learning programme. They can choose from among a selection of courses, and a faculty refresher day is organised annually. The results of teaching and lecturer evaluations done by students are discussed in the individual performance reviews. The lecturers are expected to keep a portfolio. Thought is being given to a system in which lecturers in the same subject can substitute for each other; the committee is enthusiastic about this system and about the fact that it has already been applied to several subjects.

Both students and alumni appreciate the commitment and accessibility of the lecturers. During the site visit, the committee ascertained that the master's programme Computer Science is staffed with enthusiastic people, who are willing to go that extra mile.

2.5 Accommodations and Programme oriented quality assurance

While touring the facilities during the site visit, the committee obtained a good idea of the teaching facilities in the EWI building. The lecture and instruction rooms are largely modernised, a new laboratory was built (INSYGHTLab), and the number of smaller educational rooms increased. The teaching rooms, laboratories, work and study places greatly impressed the committee.

The programme has one Programme committee (OLC) for both the bachelor and the master programme, consisting of four students and four lecturers. The study advisor of the Christiaan Huygens student association is member of the OLC.

The programme prepared an action plan based on the findings of the previous review committee, which lists the problem areas and includes a SMART planning. Study advice and supervision have become a structural part of the process.

The committee also noted that the programme has started to implement improvements in the programme-specific quality assurance in response to the Internal Audit of September 2011 (concerning student and lecturer satisfaction). This process is not yet complete, but the committee feels that the programme is proceeding well.

Considerations

The committee is very pleased with the teaching personnel, in both quantitative and qualitative terms. There is a policy in place to promote the quality of the lecturers. The focus on BKO and EWI-KO is positive and indicates that the quality of teaching is important for the programme. When considering promotions of teaching personnel, serious consideration is given to the quality of the education provided.

The committee approves the design of the teaching; the links between the different parts of the programme are clear, and they build on each other. The committee greatly appreciates the use of a wide range of teaching forms and tools, especially the web lectures, *collegerama* and the *clickers*.

The committee concludes that the completion rates are low, mainly because of a delay during the Thesis Project. Appropriate solutions are being implemented to reduce this delay. The committee is of the opinion that these solutions will contribute to the improvement of the completion rates and wishes to advise the programme to manage this process more adequately.

The committee is of the opinion that the programme is well organised and that the students are well prepared for obtaining their final qualifications. It is impressed by the way in which the programme is continuously focussing on quality improvement.

Conclusion

Master's programme Computer Science: the committee assesses Standard 2 as **good.**

Standard 3: Assessment and achieved learning outcomes

The programme has an adequate assessment system in place and demonstrates that the intended learning outcomes are achieved.

Explanation:
The level achieved is demonstrated by interim and final tests, final projects and the performance of graduates in actual practice or in post-graduate programmes. The tests and assessments are valid, reliable and transparent to the students.

Findings

During the site visit the committee examined the assessment policy, the procedures regarding testing and examination and the assessment methods of the master's programme. To this end various assessment materials have been evaluated, such as students' exams and essays, portfolios, assessment keys, assessment forms and test exams. The assessments and assessment system were also discussed with students, the staff, the Board of Examiners and the programme management.

3.1 Assessment organisation and Board of Examiners

The programme Computer Science has one Board of Examiners (for both the bachelor's and master's programme) to check that a successful student has met the graduation criteria, as described in the critical reflection. Currently, the Board of Examiners is tightening its policy in line with the 'Wet versterking besturing' [Management Strengthening Act]. It has formulated two relevant foci: a new fraud policy and *Assess-the-assessment* [Toets de Toets] *policy*. The Rules and Guidelines of the Board of Examiners state the policy concerning fraud; the most important change they have undergone is that a case of suspected fraud is no longer dealt with by the lecturer together with the curriculum coordinator but is presented directly to the examination committee. The *Assess-the-assessment policy* involves screening an examination in terms of level, problem presentation, representativity and proper evaluation by fellow teachers and an educationist. An initial pilot has already been conducted.

During the site visit, the committee discussed with the Board of Examiners the rather late implementation of the 'Wet versterking besturing'. The committee is however positive that the initiatives the Board of Examiners has arranged since then are well planned and will contribute to improving the quality processes concerned with testing.

3.2 Achieved academic level

The Critical Reflection Report describes a protocol for the organisation and assessment of the Thesis Project. The final mark for the Thesis Project is awarded by the thesis committee. The constitution of the thesis committee is approved by the Board of Examiners, and it must consist of at least three members: (1) the chair, a full professor or associate professor of the faculty, (2) a full professor, associate or assistant professor of the faculty and (3) a full professor, associate or assistant professor or an external expert. One of the core members must be a full professor, associate or assistant professor from a different field within a university. Additional members may be included from the ranks of researchers, PhD students and internal and external experts. The core members, appointed by the Board of Examiners, determine the thesis mark. The final mark is composed of scores for the quality of work, performance during thesis project, quality of thesis report and the quality of the final presentation and defence. The Thesis Project is defended in public, and the thesis is publicly accessible.

The committee agreed with the evaluations of the final projects; it did not always consider the justification of the grade adequate, but the 'ranking' of the theses reflected the grade awarded by the programme. The committee was impressed by the quality of some theses it evaluated: therefore it concluded that all master students had well earned the right to graduate.

All graduates had found jobs within six months. Of the industries where alumni work, the ICT-industry is the most prominent (66%). Every two years, the Faculty conducts a survey among recent graduates; the majority is positive about the quality and prospects of the master's programme Computer Science. This statement is confirmed by the committee during conversation with the Computer Science alumni.

The programme aims to prepare its students properly for the job market, and has created a 'klankbordcommissie' [External Advisory Board] consisting of representatives from the corporate world for advice. Annual meetings are organised to ask its opinion about the bachelor and master programme (and their curricula). The committee approves the existence of the sounding board committee, but is surprised that there are no alumni represented on it. It advises the programme to recruit some alumni to sit on the committee.

Considerations

The committee confirmed that the system of testing and evaluation is appropriate. The examinations in the programme are varied and match the learning objectives of the subjects. Students are well informed about evaluation criteria and test procedures. The introduction of revised evaluation forms for the final projects should lead to better feedback and improved comparability for the student as well.

Setting up a good quality assurance system for testing of the programme is in progress. The committee appreciates the steps that the Board of Examiners is taking and greatly values the new fraud policy and *Assess-the-assessment policy*.

Based on examination the committee concludes that the assessments are transparent and in line with the teaching objectives of the courses.

To assess the final level realised by the master students of Computer Science, the committee examined a range of final projects. It concluded that the final level of the master projects matched with what could be expected of a graduate of the master's programme in Computer Science.

Conclusion

Master's programme Computer Science the committee assesses Standard 3 as **good.**

General conclusion

In the committee's judgement, the master's programme Computer Science of the Technical University of Delft fulfils the criteria for accreditation. It has noted many positive aspects and suggested several points for improvement. It greatly appreciates the learning environment offered by the programme to the students, enabling them to achieve a high level of proficiency.

Conclusion

The committee assesses the *master's programme Computer Science* as **good.**

Appendices

Appendix 1: Curricula Vitae of the members of the assessment committee

Prof. em. J. (Jan) Paredaens was a professor at the University of Antwerp and is now dean of the Faculty of Design Sciences at the same university. He graduated as a mathematician from the Free University of Brussels and was awarded his doctor's degree in 1974 from the Free University of Brussels. He worked until 1979 in the research centre of the company MBLE in Brussels. In 1979 he was appointed lecturer in Informatics at the University of Antwerp. He filled various positions, including Dean of the Sciences Faculty. He has already been a member of the Informatics review committee in the Netherlands. His scientific specialisation is 'Databases and Data mining', on which he has published over 100 international scientific articles. He has also organised a number of international conferences in his subject and is a member of the 'Executive Committee of PODS' in the USA. He was member/chair of numerous Belgian and international committees and panels.

Prof. K. (Koen) De Bosschere is a professor at Ghent University. He graduated as a civil engineer from the same university in 1986, with a master's degree in informatics in 1987, and a doctor's degree in applied sciences in 1992. He is chair of the computer engineering programme committee. Since 2012 he coordinates the student-entrepreneurship project of the Ghent University, "Dare to venture", for which he received the Hermes prize from the University in 2012. He has been coordinator of HiPEAC since 2008, the largest European research network in computing systems. He is the author and co-author of dozens of scientific publications in the domain of the hardware-software interface, and recently also in the domain of software security. Since 2000 he has participated in various review committees, both as a member of the committee and as faculty coordinator of the computer engineering programme.

Prof. S. (Sape) Mullender is director of Network Systems in Alcatel-Lucent's Bell Laboratories and associate professor of informatics at the University of Twente. He has conducted research in the field of operating systems, multimedia systems, wireless systems and now works on the integration of data processing, communication and storage. He was a founder of the Amoeba distributed system, collaborated on the Nemesis multimedia operating system, Plan 9 from Bell Labs and Inferno. He was awarded his doctor's degree from the Free University in Amsterdam and worked there as scientific staff member until 1983. From 1984 to 1990 he was head of the distributed systems and computer networks research group at the Centre for Mathematics and Informatics (CWI) in Amsterdam. From 1991 to 1998 he was full professor in Twente; now he is an associate professor there. From 1992 to 1997 he was the world's most northerly located professor of Informatics at the University of Tromsø in Norwegen. In 1998 he began working in Bell Labs. Sape Mullender has published on file systems, high-performance RPC protocols, locating migratable objects in computer networks, and computer security, and has led a series of advanced courses in the field of distributed systems— Arctic'88, Fingerlakes'89, Bologna'90, Karuizawa'91, Lisboa'92, and Redmond'93.

Prof. W. (Wim) Van Petegem is a university professor at the KU Leuven and is also Director of Education and Learning. He completed his degree as a civil engineer at the University of Ghent and was awarded his doctor's degree in 1993 from the KU Leuven. He has worked at the University of Alberta, Edmonton (Canada), the Open University (The Netherlands), Groep T and the KHLeuven (Belgium). He teaches courses on multimedia production and the development of teaching materials (multimedia). His research interests encompass multimedia production, new teaching technology, networked e-leren, virtual mobility, lifelong learning, open and remote education, knowledge transfer and scientific

communication. In his specialist field he is involved in numerous international research, development and implementation projects as investigator, coordinator, partner or expert, and he is on the board of various international networks. Given his expertise he has already been a committee member for review committees, in Flanders, the Netherlands and further afield.

R. (Ruud) Verbij, Bsc, is a student of the master in Computer Science, security specialisation track, of the University of Twente, Radboud University of Nijmegen and the Technical University of Eindhoven. As a student Ruud has committed himself to education, for example by being on the education evaluation committee for 3 years, the programme committee for 2 years and a full-time year on the board of his student association. Since September 2010 Ruud has been a student panel member for the accreditation of initial programmes for the NVAO and since September 2012 also for institutional reviews. In January 2013 Ruud set up his own consultancy firm in the field of programme accreditation.

Appendix 2: Domain-specific framework of reference

1. Domain-specific frame of reference for Master's courses in Computer Science

1.1 Learning outcomes in general
Students to whom a master's degree is awarded:

- Have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with Bachelor's level, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research[1] context;
- Can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study; Have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements;
- Can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously; have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous.

1.2 Domain specific contents, the nature of Master degree courses
The Master's degree course will build upon knowledge and understanding at undergraduate level. The core of this knowledge and understanding is as described by the Joint Task Force for Computing Science Curricula of ACM/IEEE-CS in their (draft) report "Computing Science Curricula 2013" (http://cs2013.org/). The contents of the Master's programme should lead the student towards the frontiers of design and applications in the field, and/or towards the major research issues in the field.

The students in the Master's degree course will generally concentrate on subjects in a limited Specialisation within the field, or in the border region with adjacent fields. If the course borders on adjacent fields (Management Sciences, Electrical Engineering and Telecommunication, Cognitive Science, ...) it will meet international standards which are not necessarily only the standards set for Computing Science Curricula. In particular such courses have identified a (international) community of courses of a similar nature and they will fit the standards of that community.

The Master's degree course may not aim at educating students to be researchers, or it may have tracks for students who do not aim at such a goal. There is however always a strong relationship between the degree course and research activities, and researchers are active as lecturers and supervisors in the degree course. Even if a student who is awarded the degree is not trained to be a researcher, he will have a basic understanding of the nature of research, and he will have proven research skills.

In each degree course there will be a final project that takes at least one quarter of the entire course. In the final project the student can show his capabilities in each of the five fields of

[1] The term 'research' is used to cover a wide variety of activities, with the context often related to a field of study. The term is used here to represent a careful study or investigation based on a systematic understanding and critical awareness of knowledge.

the Dublin descriptors (knowledge and understanding, application of knowledge and understanding, forming judgments, communication and learning skills).

1.3 Preparation for a further career in a PhD position or as a highly qualified professional in the field
A talented and successful student in the Master degree course must be educated to a level where he is eligible for a PhD-position. Participation in research projects, especially during the final project must be open to such students.

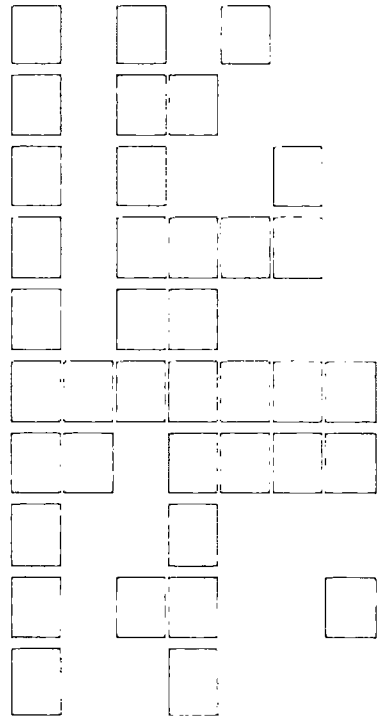
The Master's degree course must address the development of skills and competencies that are essential for a working professional. It must be possible for students to participate in cooperation with trade and industry, in particular during a final project. This requires the courses to have sufficient contacts within trade and industry.

2. Comparison of 3TU academic criteria by Meijers at al. (2005) and the Domain Specific Frame of Reference for Computer Science (Version dated 14 Nov 2012).

3TU academic criteria	Domain Specific Frame of Reference
Competency in one or more scientific disciplines	Demonstrates knowledge and understanding that is founded upon and extends and/or enhances that typically associated with the Bachelor's degree level and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context
Competency in conducting research	Can apply knowledge, understanding and problem-solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the specific field of study
Competency in designing	Can apply knowledge, understanding and problem-solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the specific field of study
Scientific approach	See competency in research and designing
Competency in cooperation and communication	Can communicate conclusions, as well as the underlying knowledge and rationale, clearly and unambiguously to specialised and non-specialised audiences
Basic intellectual skills	Has the learning skills needed in order to continue to study in a manner that is largely self-directed or autonomous
Consideration of the temporal and the social context	Has the ability to integrate knowledge, handle complexity and formulate judgements with incomplete or limited information, while reflecting on social and ethical responsibilities associated with the application of knowledge and judgements

3. Common courses CS and 3TU academic criteria

Course code	name	Academische criteria 3 TU 1 2 3 4 5 6 7
IN4010	Artificial Intelligence Techniques	
IN4085	Pattern Recognition	
IN4086	Data Visualization	
IN4150	Distributed Algorithms	
IN4301	Advanced Algorithms	
IN4303	Compiler Construction	
IN4304	Empirical Research Methods	
IN4309	Random Signal Processing	
IN4315	Web & Semantic Web Engineering	
WI4301IN	Statistical Multivariate Data Analysis	



Appendix 3: Intended learning outcomes

The final attainment level derived from the above-discussed criteria for the Master's degree in Computer Science is as follows:

1. Graduates have general knowledge of computer science and the relevant issues of mathematics and computer engineering. Each graduate has in-depth knowledge in one of the particular domains of computer science mentioned below (as well as in the associated area of application) and has demonstrated the ability to apply it through a Master's thesis project.

- **Bioinformatics:** Computational biology; Machine learning; Algorithms for systems biology; heterogeneous database technologies; Swarm-based computation; Image analysis in microscopy; algorithms for inference, enhancing, executing and mining biological networks; visualizing complex and heterogeneous data; mathematical modelling; analysis and simulation of biochemical processes.

- **Information Architecture:** Specific fields: information systems; information architecture; data management; business process management; service architecture; enterprise architecture; business-service alignment.

- **Media & Knowledge Engineering:** processing, analysis, indexing and retrieval of text, speech, audio and visual data; computer graphics; machine learning; interactive intelligence in the form of decision support systems; agent-based modelling; training & exposure therapy through virtual gaming environments; quality of experience; affective computing and robotics; security and privacy aspects of modern ICT.

- **Software Technology:** distributed systems; grid and cloud computing; high performance computing; p2p systems; algorithmic game theory; mechanism design; coordination algorithms; distributed planning and scheduling; diagnosis and repair; web-based systems; web engineering; semantic web; social web; web science; software testing; software architecture; collaborative development; model-driven engineering.

2. Graduates are able to identify, analyse model and solve problems and to implement and test solutions within their chosen domains for a broad range of application areas. They know how to work individually or in teams. They are able to do the following:

- Analyse and conceptualise at a formal and abstract level;
- Understand the fundamental issues of this field and contribute to research and the further development of the field;
- Position their contributions within the wider scope of the overall development of science and technology, as well as within industry and society;
- Communicate (orally and in writing) about results and methodology to their colleagues in the professional field, as well as to lay audiences.

Appendix 4: Overview of the curriculum

Course code	name	Academische criteria 3 TU 1	2	3	4	5	6	7
IN4010	Artificial Intelligence Techniques	■		■		■		
IN4085	Pattern Recognition	■		■	■			
IN4086	Data Visualization	■		■			■	
IN4150	Distributed Algorithms	■		■	■	■	■	
IN4301	Advanced Algorithms	■		■	■			
IN4303	Compiler Construction	■	■	■	■	■	■	■
IN4304	Empirical Research Methods	■	■		■	■	■	■
IN4309	Random Signal Processing	■			■			
IN4315	Web & Semantic Web Engineering	■		■	■			■
WI4301IN	Statistical Multivariate Data Analysis	■			■			

Table 1: Common courses master's programme Computer Science and 3TU academic criteria

Course sizes in EC, default size = 5 EC	BI	IA	MKE	ST
Common core courses	28	19/20	36	25/26
Selected specialisation courses	min 15	29	min 10	min 10
Seminar/Literature Survey	0/15	5/10	5/10	5/10
Homologation/Free Electives	max 12	max 10	max 9	max 10
Other specialisation courses	min 5	min 3	min 5	min 5
Thesis	45	45	45	45

Table 2: Overview of track programmes

Appendix 5: Quantitative data regarding the programme

Data on intake, transfers and graduates

Number of students	Year					
	2005	2006	2007	2008	2009	2010
Total population registered*	118	165	197	191	204	185
male/female	110/8	155/10	180/17	177/14	186/18	170/15
intake cohort	83	111	85	50	88	41
intake cohort male/female	79/4	101/10	75/10	48/2	80/8	37/4
% intake MSc CS in NL	50	47	38	27	43	26
total graduates in year	44	32	47	55	52	41
% graduated MSc CS in NL*	50	35	38	38	35	31

Table 3: Students Numbers (VSNU)
** Source VSNU Table M5.1, M4.1, M6.1 (www.vsnu.nl/ Feiten en cijfers)*

Number of students*	Year					
	2005	2006	2007	2008	2009	2010
TU Delft	76	94	66	41	67	30
Other Dutch university	0	1	4	2	1	0
Dutch university of applied sciences	2	7	8	5	4	0
Foreign university	5	9	7	2	16	11
Total	83	111	85	50	88	41

Table 4: Origin of intake into the Master's programme in CS
** Source VSNU Table M1.1*

Graduates from*	Year					
	2005	2006	2007	2008	2009	2010
TU Delft	20	22	28	28	33	39
Other Dutch university				34	27	29
Dutch university of applied sciences		23		24	42	35
Foreign university	24	25	26	25	36	24

Table 5: Average Length of study, by origin of intake into the Master's programme in CS programme (expressed in months)
** Source VSNU Table M3.1*

	2005		2006		2007		2008		2009		2010		2011	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Ref date 31-8-2012														
M CS Passed	42		25		43		49		51		39		64	
M-MKE Passed	34		26		36		39		31		15		7	
Ref date 31-1-2013														
Influx from Master's degree programme to PhD programme in the domain of CS	4	10%	1	4%	3	7%	6	12%	4	8%	4	10%	1	2%
Influx from Master's degree programme to PhD programme in the domain of MKE	4	12%	3	12%	1	3%	4	10%	3	10%	0		3	43%

Table 6: Number of students graduating/ starting a PhD project

Teacher-student ratio achieved

	Numbers or Percentage
Student-staff ratio	13
Full professors	16
Associate professor	12
Assistant professor	16
Lecturer	3
Staff members with PhD	94%
UTQ/ EEMCS-TQ obtained	53%
UTQ/ EEMCS-TQ enrolled	21%
Exemption from UTQ due to age and/or small teaching load	26%

Table 7: Overview of teaching staff

Average amount of face-to-face instruction per stage of the study programme

The average contact hours in a week is 12 hours.

Appendix 6: Programme of the site visit

Thursday 16 May 2013			
tijd / *time*	**onderwerp / *subject***	**uitgenodigde personen / *invited persons***	**nadere informatie / *additional information***
10:00 – 15:00	Preliminary meeting	*Assessment committee*	
15:00 – 16:00	Management	Dr. E.A. (Emile) Hendriks	Director of Education BSc TI, MSc CS
		Dr. ir. J.F.M. (Hans) Tonino	Director of Education Faculty EEMCS, TU Delft
		Mw. drs. M.J.H. (Kalinka) Gnjpink	Education Advisor Faculty EEMCS, TU Delft
		Mw. dr. J. (Julia) Caussin	Programme coordinator BSc TI
		Prof. dr. A. (Arie) van Deursen	Acting chair department SCT Faculty EEMCS
		Prof. dr. C.M. (Catholijn) Jonker	Acting chair department INSYFaculty EEMCS
		Mw. Drs. D.I. Stadler	Head Education and Student Affairs
16:00 – 17:00	Students (Bachelor and Master)	D.G. (David) Allaart	1st year
		J.W. (Janwillem) Manenschijn	2nd year, Computersystems
		H.J. (Herman) Banken	2nd year Information and Knowledge Engineering
		R.B.G. (Ruben) Starmans	2nd yar, Imaging
		S.P. (Bas) Metman	3rd year
		R.S. (Rutger) Plak	MSc / ST student
		P.A. (Pieter) Hameete	MSc / IA student
		M. (Madalin) Dumitru-Guzu	MSc / MKE student (International)
		N.N. (Nanne) Aben	MSc / BI student
17:00 – 17:30	Alumni	Ir. M. (Machiel) Visser	Alumnus MKE: Scarabee
		Ir. A. (Athanasios) Antoniou	Alumnus ST:
		Ir. R. (Richard) Stronkman	Alumnus IA/ST?: eigen bedrijf
		Ir. R. (Roy) Straver	Alumnus BI: VU Mc
		Ir. N.N. (Noeska) Smit	Alumnus MKE: promovendus TUDelft
		Ir. M.J.C. (Mark) Hendrikx	Alumnus MKE:
		Ir. J.E.G. (Jasper) Oosterman	Alumnus IA/ST?: promovendus TUDelft
17:30 – 18:00	Committee meeting	*Assessment committee*	
19:30 –	Diner (committee)	*Assessment commitee*	

Friday 17 May 2013			
tijd / *time*	**onderwerp / *subject***	**uitgenodigde personen / *invited persons***	**nadere informatie / *additional information***
09:00 – 10:00	Staff (Bachelor and master)	Dr. T. (Tomas) Klos	1st year Software Technology
		Prof. dr. A. (Arie) van Deursen	2nd/3rd year Software Technology
		Dr. K.V. (Koen) Hindriks	1st year / Media and Knowledge Engineering
		Dr. ir. J.H. (Jos) Weber	Mentoraat / Media and Knowledge Engineering
		Prof. dr. K.G. (Koen) Langendoen	2nd year / Software Technology
		Dr. ir. W.P.(Willem-Paul) Brinkman	2nd year / Media and Knowledge Engineering
		Dr .ir. R.C. (Richard) Hendriks	2nd year / Media and Knowledge Engineering
		Dr .ir. D. (Dick) de Ridder	2nd year / Bioinformatica
		Dr. ir. A.J.H. (Jan) Hidders	1st/2nd / Information Architecture
10:00 – 10:30	Educational committee	*Students and staff*	
		Dr. M.M. (Mathijs) de Weerdt	Chair Board of Studies TI/CS
		Dr. K.V. (Koen) Hindriks	Member Board of Studies TI/CS
		V.J. (Vincent) Koeman	Student member Board of Studies TI/CS
		H.J. (Herman) Banken	Student member Board of Studies TI/CS
		Mevrouw dr. J.P.R.B. (Joanna) Daudt	Education Advisor Faculty EEMCS, TU Delft
10:30 – 11:15	Board of Examiners and student advisors	*Students and staff*	
		Ir. H.J.A.M. (Hans) Geers	Acting chair, Board of Examiners TI/CS
		Dr. ir. A.J.H. (Jan) Hidders	Member board of Examiners TI/CS
		Dr. ir. F.A. (Fernando) Kuipers	Member board of Examiners EEMCS
		Mw. drs. M.J.H. (Kalinka) Grijpink	Education Advisor Faculty EEMCS, TU Delft
		Mw. ir. G. (Gytha) Rijnbeek	academic advisor
11:15 – 11:45	Consulting hour	*No applications*	
11:45 – 13:00	Lunch and preparation meeting management	*Assessment committee*	
13:00 – 13:45	Managment	Dr. ir. J.F.M. (Hans) Tonino	Director of Education Faculty EEMCS, TU Delft
		Dr. E.A. (Emile) Hendriks	Director of Education BSc TI, MSc CS
		Prof. dr. A. (Arie) van Deursen	Acting chair department SCT Faculty EEMCS
		Prof. dr. C.M. (Catholijn) Jonker	Acting chair department INSYFaculty EEMCS
		Mw. drs. D.I. Stadler	Head Education and Student Affairs

13:45 – 15:30	Meeting committee formulating results	*Assessment committee*
15:30 – 16:00	Formal preliminary report	*Public*
16:00 – 17:00	Drinks	*public*

Appendix 7: Theses and documents studied by the committee

Prior to the site visit, the committee studied the theses of the students with the following student numbers:

1221736	4108140	1387367
1153692	4123395	1174878
4046293	1157868	1217437
4122046	1308033	1549189
1314114	4119800	1308181

During the site visit, the committee studied, among other things, the following documents (partly as hard copies, partly via the institute's electronic learning environment):

- Gedistribueerde Aloritmen;
- Databases;
- Artificial Intelligence Techniques;
- Random Signal processing;
- Programma, verslag van de Onderwijsdag.

Appendix 8: Declarations of independence

nvao

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM:
Dhr. Jan Paredaens

PRIVÉ ADRES:
[illegible]
B-1981 [illegible]

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Informatica

AANGEVRAAGD DOOR DE INSTELLING:

[illegible]

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

nvao

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Antwerpen DATUM: 26.4.13

HANDTEKENING:

nvao

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM:
Dhr. [illegible]

PRIVÉ ADRES:
[illegible]

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Informatica

AANGEVRAAGD DOOR DE INSTELLING:

[illegible]

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

nvao

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE

PLAATS: Antwerpen. DATUM: 26/4/2013

HANDTEKENING:

nvao

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Sjoerd J. Mullender

PRIVÉ ADRES: Prinsengracht 797

1017 LA Amsterdam

(1) ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING

D Technische Informatica

M Computer Science

AANGEVRAAGD DOOR DE INSTELLING

Technische Universiteit Delft

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRINCIPEPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVOCAAT, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN.

nvao

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN.

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEMZIJNAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE

PLAATS: Amsterdam DATUM: 4-4-2013

HANDTEKENING:

nvao

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Ruud Verbij

PRIVÉ ADRES: Borstelweg 40, Enschede

(1) ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

LRaHD: 56978/56965/56978/66300/66978/66294/66300/66802

AANGEVRAAGD DOOR DE INSTELLING:

TU Delft/Open Universiteit/Universiteit Utrecht/Universiteit van Amsterdam/Vrije Universiteit

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VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Enschede DATUM: 2-4-'13

HANDTEKENING:

nvao

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

DIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Wim Van Petegem

PRIVÉ ADRES: Brantenlaan 4

3-3012 Wessel-Nu

België

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Informatica

AANGEVRAAGD DOOR DE INSTELLING:

VUB, RUG, TU/e, Radboud Nijmegen

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VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DIE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

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VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE

PLAATS Leuven DATUM 29/3/2013

HANDTEKENING:

nvao

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

DIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM:

PRIVÉ ADRES:

IS ALS DESKUNDIGE SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

AANGEVRAAGD DOOR DE INSTELLING:

VERKLAART HIERBIJ GEEN (AANVULLENDE) OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PROEFPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN.

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VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS

DATUM

1 mei 2013

HANDTEKENING: