Informatica

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CONTENTS

This report was finalized on 16 December 2013

Report on the master's programme Computer Science of Utrecht University

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:	Informatica
CROHO number:	66978
Level of the programme:	master's
Orientation of the programme:	academic
Number of credits:	120 EC
Specializations or tracks:	
Location(s):	Utrecht
Mode(s) of study:	full time
Expiration of accreditation:	31-12-2014

The visit of the assessment committee Informatica to the Faculty of Science of Utrecht University took place on 19 and 20 September 2013.

Administrative data regarding the institution

Name of the institution:	Utrecht University
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 is professor Computer Science at 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;
- R. Verbij Bsc (student member), master 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.

Utrecht University 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).

Appendix 1 contains the curricula vitae of the members of the committee.

Working method of the assessment committee

The assessment of the master's programme Computing Science 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 (chair), retired professor in Database Research, Antwerp University;
- Prof.dr. L. Bijlsma (member), professor in Education and Software Construction and Vice-dean of the Faculty of Management, Science and Technology, 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 April 26, 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 Report 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.

In addition to the Critical Reflection Report, the committee members read a total of fifteen theses from the master's programme. The theses were randomly and stratified chosen from a list of graduates of the last two academic years according the NVAO guideline.

Site visit
A preliminary programme for the site visit was made by the coordinator and adapted after consultation of the committee chairman and the programme coordinator of Utrecht University. The timetable for the visit in Utrecht 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 made to make use of this possibility.

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 Utrecht University.

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.

Summary judgement

This report reflects the findings and considerations of the committee on the master's degree programme in Computer Science of Utrecht University.

Standard 1: Intended learning outcomes
The master's degree programme Computer Science consists of three master research programmes (Computing Science, Technical Artificial Intelligence and Game and Media Technology). The overall aim of the programme is to prepare students for a career in research. By choosing one of the three programmes from the start, students specialize in one particular field.

According to the committee, the level and orientation of the programme reflect the Domain Specific Framework of Reference and meet international academic standards. The intended learning outcomes show that the management has succeeded in identifying generic learning outcomes for all three programmes. The committee advises the programme to also set learning outcomes for each programme individually, to exemplify the individual characteristics of the programmes and to highlight their unique character in comparison to similar programmes elsewhere – nationally and abroad.

The committee is pleased with the intention expressed by the programme management to pay more attention to the demands of students not wishing to continue a career in research. Instead of supporting the idea for a new, one-year master's programme, the committee is in favour of paying more attention to job orientation in the curricula of the current programmes.

Standard 2: Teaching-learning environment
The committee concludes that the contents and design of the curriculum are adequate to ensure that students can obtain the intended learning outcomes. However, it also concludes that the curriculum has a complicated structure, as the rules differ for each of the three programmes within the master degree programme. The committee is pleased about the possibility for students to set out their own studypath. It concludes that this does place an urgent call for an intense level of study guidance.

The committee is satisfied with the teaching personnel, in both quantitative and qualitative terms. The educational policy of Utrecht University encourages lecturers to obtain not only a basic, but also a senior teaching qualification (SKO in addition to BKO). This shows that it takes the quality of teaching seriously. The committee is impressed by the way in which the programme is continuously focussing on the improvement of the quality of teaching.

The committee concludes that the completion rates are low, mainly because of a delay during the Research project. Appropriate solutions are being implemented to reduce this delay. The committee is confident that these solutions will contribute to the improvement of the completion rates.

On two specific aspects of the teaching-learning environment the committee concludes that there is room for improvement. These entail study guidance (which is in the opinion of the committee too dependent on the work of the programme coordinator) and internal quality assurance. The Educational Advisory Committee should make itself much more visible in the programme, towards students as well as towards staff and programme management. Both

parties should be aware that this committee can play an important role in contributing to the overall quality of the programme.

Standard 3: Assessment and achieved learning outcomes
The committee has examined the quality of the assessment and concludes that it is sufficient throughout the whole programme. The examinations in the programme are varied and match the learning objectives of the subjects. Students are well informed about assessment procedures. The introduction of a new Assesment Form, provided by the Graduate School for the assessment of the thesis project, should lead to more clarity on what the final grade is based on. This form, the committee concludes, needs to be better implemented and better formalized.

The committee is impressed by the active role taken by the Board of Examiners, the Exam Subcommittee and the Assessment Advisory Board.

To assess the level achieved by the master students of Computer Science, the committee examined a range of master's theses. It concludes that the final level of the master projects is generally high and matches with what can be expected of a graduate of the master's research programme in Computer Science.

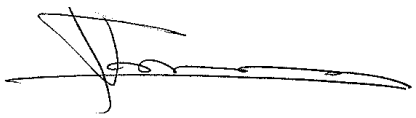
In the committee's judgement, the master's programme Computer Science at Utrecht University fulfils the criteria for accreditation. It has noted many positive aspects and suggested several points for improvement. It is confident that the programme management will continue to improve the quality of its teaching-learning environment and the assessment procedure for the master's theses.

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	satisfactory
Standard 3: Assessment and achieved learning outcomes	satisfactory
General conclusion	satisfactory

The chair 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: 16 December 2013



prof.dr. J. Paredaens

L. Kozlowska, MA

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.

Profile
The master's degree programme Computer Science at Utrecht University is one of nine master programmes under the responsibility of the Graduate School of Natural Sciences, situated in the Science Faculty. The master's programme Computing Science is the result of a merger of two separate programmes (Software Technology en Applied Computing Sciences) in 2011. The master's degree programme is divided in three different programmes: Computing Science (CS), Technical Artificial Intelligence (TAI – to be merged in 2013/2014 with a related programme Cognitive Artificial Intelligence offered by de faculty of Humanities), and Game and Media Techology (GMT). This last programme attracts most students. All programmes are research masters, which implies that they are geared towards preparing students for a PhD-position or at least for conducting research. The committee finds the merger of the programmes Technical Articial Intelligence and Cognitive Artificial Intelligence a positive development, which will contribute to the quality of the master's degree programme.
The staff that delivers the programme is employed by the Department of Information and Computing Sciences, which consists of four sections: Sofware systems, Artificial intelligence, Interaction Technology and Virtual Worlds. The Department of Information and Computing Sciences also delivers the master programme Information Science, which approaches ICT from a business perspective and enables students from Computer Science to follow courses on, for example, ICT Entrepreneurship and Business.

As stated in the self-assessement report, the overall aim of the programme is 'to educate students to be optimally prepared for conducting top level research, both in a disciplinary and interdisciplinary environment, at universities, research institutes, or in business and industry.' By choosing one of three programmes, students specialize in a particular field within the broad field of computer science. The programme has selected those fields of study in which researchers of the Department are actively involved. It is, however, also considering offering a one-year master's degree programme on Mobile computing or Interactive digital media, aimed at students who do not wish to continue their career as a researcher.

Level and orientation
The intended learning outcomes of the master's degree programme Computer Science are based upon the learning outcomes specified in the Domain Specific Framework of Reference,

formulated by the Computer Science Chamber of the VSNU (Vereniging Samenwerkende Nederlandse Universiteiten) (see Appendix 2). The intended learning outcomes of the programme are listed in Appendix 3.

The degree programme positions itself with regard to other programmes offered by universities in the Netherlands by pointing out the similarities and differences between the three programmes and similar programmes elsewhere. It concludes that the Games and Media Techonology programme, with a research focus on (serious) games, is unique in the Netherlands.

The degree programme identifies 14 specific competences which students have to acquire. The committee has studied these learning outcomes and concludes that they are in line with the Domain Specific Framework of Reference and with the international requirements for a master's degree programme at an academic level. All categories of the Dublin descriptors ('knowledge and understanding', 'applying knowledge and understanding', 'judgement', 'communication' and 'learning skills') are represented.

Considerations

The committee concludes that the Game and Media Technology (GMT) programme, currently the most popular programme within the master's degree programme, strongly influences the programme as a whole. The committee appreciates that the management, by offering this particular programme, has succeeded in attracting students who otherwise might not have chosen to study Computer Science at an academic master's level. On the other hand the committee also expresses its concern that the popularity of this particular programme might be subject to fashion. Therefore, it recommends that in this programme, sufficient attention is paid to the techniques that are not only applicable in the specialized field of game technology, but in the field of Computer Science as a whole.

The committee has taken notice of the plans expressed by the management to offer a new, one-year programme for students who most likely will not pursue a career in research. The committee is pleased to hear that the programme seems aware of students' wishes with respect to a future career, but concludes that within the existing programmes, more attention could be paid to job orientation. Even though the master's programmes are research masters, not all students will be able to continue with a career in research. The committee finds it important that students are well-informed about their possibilities on the job market, whether in or outside research and/or university.

The committee is of the opinion that the learning goals of the programme, although slightly generic because they cover three very different programmes, are carefully formulated and meet international standards. The committee thinks that the degree programme as a whole would benefit from formulating separate learning outcomes for its three different programmes. Doing so would, in the opinion of the committee, help to further specify the profile and unique selling points of the degree programme compared with similar programmes in and outside the Netherlands.

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

The curriculum of the master's degree programme Computer Science (120 EC) is divided into eight blocks: four blocks in the first and four blocks in the second year. Each block consists of ten weeks, allowing students to follow two courses of 7,5 EC next to each other. Although the programme does not set fixed rules as in which order courses should be taken, students are generally expected to follow eight courses in the first year, and two in the second year. The last three blocks of the second year are reserved for a research project resulting in a master's thesis (45 EC). An overview of the programme can be found in appendix 4.

The Graduate School of the Faculty of Science works with three categories of courses: mandatory courses and primary and secondary electives. As stated in the Self Assessment Report, the master's degree programme Computer Science purposely does not offer mandatory courses, but allows students to choose from a set of elective courses. The primary electives have to be filled in within the own specialization programme (amounts vary between the programmes from four to six courses). The secondary electives are divided into a part to be filled in within the master's degree programme (three courses for CS and three or four courses for TAI) and a small part to be filled in outside or within the discipline (2 courses at most). The programme coordinator checks whether the courses selected by each individual student form a coherent set.

2.1.1 Computing Science

According to the self-assessment report, the master's degree programme Computing Science focuses on 'algorithm design and analysis, advanced planning and decision making, algorithmic data analysis ('big data') and programming technology'. These foci correspond with the 'study lines' within the programme. Students are required to choose one of the four focus areas and fill their primary electives with courses from that specific study line.

2.1.2 Technical Artificial Intelligence

The master's programme Technical Artificial Intelligence looks at artificial intelligence from a technical, computer science perspective. The programme is divided into four segments. The first two segments consists of three courses each with an introductory character. In the last two segments, students apply the knowledge and techniques acquired earlier. Since this programme attracts the least students, it will be merged with a related programme offered by the Faculty of Humanities. The new programme will be embedded in the Science Faculty.

2.1.3 Game and Media Techology
The Game and Media Technology programme, similar to the Computing Science programme, consists of four focus areas: 'modeling', 'recognition', 'interaction' and 'geometric computing'. The programme offers three courses within each focus area. In contrast to Computing Science, GMT student are not required to choose one study line. Instead, they are allowed to combine courses from different focus areas. In contrast to both CS and TAI, GMT-students are expected to fill in all primary electives within their own programme.

In addition to regular courses, there are courses, there are three courses with an alternative setup:

Experimentation project (7,5 or 15 EC): setting up and evaluating an algorithmic experiment under the supervision of a staff member (mandatory in the GMT programme in addition to the final research project).
Seminar (7,5 EC): studying and discussing recent papers in a small group. Not compulsory, but students are recommended to take at least one seminar.
Colloquium series: a series of talks by students, staff and guest speakers for each programme covering recent research. Mandatory for all tracks.

Each course is concluded with an exam or with a report, oral presentation or practical assignment at the end of the block. If the final grade is unsatisfactory, but at least 4, students are allowed to take a resit. A description of the assessment policies is given in Standard 3.

The master's degree programme concludes with a research project, resulting in a master's thesis and a presentation of the project (45 EC). Students either carry out a theoretical study, or make a new (software) design and implement it if possible.

The didactical concept underlying the master's programme is that of learning by doing. To achieve this in many courses there is time allocated for group discussions, presentations and writing assignments. Research skills are carried out at different levels, finally resulting in the research project at the end of the studies.

The committee has studied the programme and the formulated learning outcomes for each course. It concludes that each individual track offers students a coherent curriculum that ties in well with these intended learning outcomes. The committee is enthusiastic about the possibility for students to specialize in one area within Computer Science and to fill in their own study path within the programme they have chosen. The committee nevertheless also expresses its concerns about the complicated structure that has arisen due to the existence of three programmes and the different composition of (primary and secondary) courses within each programme. Although officially there are no mandatory courses, there are quite a few restrictions as to which courses can be followed within which programme. For instance, GMT-students have to take all courses except two within their own programme, CS-students focus on one of four study lines within their own focus area, and TAI-students have to follow the build-up of their programme in four quarters. From such a structure, the question arises of what exactly it is that ties the different programmes together. This makes the call for a strong profile that answers that question more urgent. Also, it creates a pressing need for an intensive level of study guidance (see 2.3).

The committee concludes that the composition of the Game and Media Technology complies well with current trends in the area of game technology (e.g. virtual worlds, artificial intelligence, mobile gaming, augmented reality, real time simulations and parallelism).

The research project at the end of the master's degree programme is with 45 EC extensive compared to research projects carried out in similar programmes elsewhere. During the site visit, the programme management explained that the project duration of three quarters of a year ties in better with the demands of the business world. The management added that there are now plans to divide the research project in two parts: a literature study at the beginning to (which would count as a separate course of 15 EC) and carrying out the project and writing the thesis (30 EC) at the end. Although the committee was satisfied with the theses it read, it did not consider them considerably better than theses written in a period of six months. It therefore strongly favors the plans for a new set up.

2.2 Level and orientation

The programme is shaped along the lines of the Association of Machinery Computing (ACM) reference curriculum. A matrix provided in the self-assessment report shows that the courses in the first year concentrate on acquiring knowledge and developing communication skills, whereas those in the second year demand the application of knowledge and the development of learning skills and the ability to judge and reflect upon research – necessary requirements for working independently as a researcher. In the thesis project, all skills are supposed to come together.

The committee has examined the relationship between the intended learning outcomes and the programme. It concludes that the links between these learning outcomes and the programme are demonstrable. Furthermore, the committee is of the opinion that the development of academic research and writing skills is sufficiently addressed.

Finally, the committee concludes that the scientific orientation of the programme is safeguarded by the fact that courses are taught by staff of the research institutes, who are able to teach students about the state of the art in their own (field of) research.

2.3 Study load, guidance and rates

Study load

As stated before, the curriculum of the master's degree programme Computer Science (120 EC) is divided into eight blocks of ten weeks. Students usually follow eight courses in the first year, two at the end of the second year, and spend three blocks carrying out their research project and writing their thesis. As stated in the self-assessment report, most courses consist of two hours of lectures twice a week. For seminars and project courses, the amount of weekly contact hours usually is lower. The programme management calculates the average of contact hours per week as 'almost 9'. It estimates that the contact hours, complemented by self-tuition hours, leads to a study load of a full-time work week. The student representatives of the Master's programmes with whom the committee spoke during the site visit were of the opinion that the programme in its current form is feasible, provided students keep up to date with their work. So far, they did not identity major hurdles hampering study progress.

Guidance

An important role in the process of study guidance of the master's degree programme Computer Science is reserved for the programme coordinator (PC). Not only does the PC, as an advisor of the Admission Committee of the Graduate School of Natural Sciences advise which students are (with or without having to take deficiency courses) eligible to enter the programme. He also helps every student to compose a feasible study plan (with a balanced and coherent set of courses within their programme of choice) and decides whether students are allowed to take certain courses outside their own programme. A study advisor monitors

whether some courses might need rescheduling. The study advisor is also the person to whom students can turn with study problems that are not content-related.

The committee is concerned that the process of study guidance depends to a large extent on the efforts of limited number of persons. The predicted rise in the numbers of students enrolling in the master programme will result in an even higher demand for study guidance. It advises the programme management to reconsider which possible improvements could be made to the process of study guidance to ensure that this burden is spread more evenly. Students mainly take too long carrying out their research project, and they are not always very satisfied with the study guidance offered in this period. The committee is satisfied to hear that the programme management recognizes these concerns and is planning to implement more regular evaluations during the research project.

Rates
The master's degree programme Computer Science is aimed at students who have successfully completed a bachelor's degree in Computer Science. The number of enrolling students for all three programmes fluctuates between approximately 90 to 100. Since 2010 the proportion of foreign students has increased to approximately 30%. The programme management aims at a student intake of approximately 80 per year. A distinction is made between four categories of applicants. Generally, direct access to the programme is granted to students who have received a bachelor's degree in Computer Science from a Dutch university. The second, third and fourth category of applicants consists of three groups of students which are invited to apply, but will be individually assessed by the Admission Committee of the Graduate School of Natural Sciences (advised by one of the programme coordinators of Computer Science). These are students with a foreign university bachelor's degree in Computer Science, students with a Dutch, HBO (University of Applied Sciences) bachelor's degree in Computer Science and students with a bachelor's degree in Science in a discipline other than Computer Science. If students do not (entirely) fulfill the entry requirements, they can either be refused or required to take deficiency courses during the first year. If the lack of knowledge or skills is too big for direct access, student may have to follow a premaster programme. The division between intake in the three tracks is roughly 40% (CS) – 40% (GMT) – 20% (TAI). The programme management expects that the inflow of the GMT programme will increase as a result of the establishment of a GMT-specific track in the bachelor's degree programme in 2010.

On the whole, the committee agrees with the admission rules set by the Board of Admissions of the Graduate School. It is, however, surprised to learn that it is possible to follow the degree programme without having taken a course on 'concurrency'. A more pressing point of concern, the committee finds, is the fact that students in the master programme Computer Science take a relatively long time to graduate (with an average of 35 months) and that quite a few students who enrolled in the programme do not graduate at all. This delay is almost solely caused by the fact that students take too long carrying out their research project, which stresses the need for plans to revise the structure of this course and to intensify and formalize the amount of study guidance offered.

The percentage of female students in the programme is low (10%). The committee urges the programme management to keep paying attention to the intake of female students. The argument that 'the gender ratio is not different from the gender ratio in computer science degree programmes elsewhere' is, in the opinion of the committee, no excuse to stop trying to correct this imbalance.

2.4 Composition of the academic staff

The staff of the master's degree programme consists of 48 lecturers (10 of whom hold a position as professor) and 32 PhD-candidates who regularly assist in the teaching process. Of the lecturers, 92% holds a PhD. The student-staff ratio in the master's programme is 1:34.5.

Utrecht University pays a lot of attention to its educational policy. Lecturers are required to obtain teaching qualifications. Nearly all members of staff have obtained the *Basis Kwalificatie Onderwijs* (BKO, 96%) 35% have also obtained the *Senior Kwalificatie Onderwijs* (SKO). The BKO is a prerequisite for a tenure track position. The committee is pleased to see that the educational staff is given more than sufficient support from the management in further developing their teaching skills.

During the site visit, the committee paid considerable attention to the high teaching load, mainly in the bachelor degree programme, but also in the master degree programme. To decrease this load, new lecturers will be employed who will devote their time almost exclusively to teaching. In addition, a new professor (in the research field of Interaction Technology) will be appointed. The committee is of the opinion that the programme management has a clear vision on measurements necessary to reduce the teaching load (to 55-60%) thereby strengthening current research. It is confident that these measurements will be beneficial to the programme as a whole.

2.5 Accommodations & Internal quality assurance

The committee was able to get a good idea of the teaching facilities in the Buys Ballot Building during the visit. The lecture rooms and rooms for carrying out practical assignments made a good impression. The committee was particularly impressed with the Motion Capture Lab for the Game and Media Technology programme. Students testify that the facilities are adequate, provided that one does not want to carry out a too complicated computer experiment.

The committee concludes that the programme should try and keep up to date with the development of new teaching methods that involve modern communication techniques such as web classes, clickers and Twitter. The website could also do with modernization and restructuring. The students with whom the committee spoke, mentioned that all study information can eventually be found on the website, but that it is often hard to find. The committee expects that the programme will have no difficulties to implement the necessary changes here.

The committee has assessed to what extent students and graduates are involved in the shaping and evaluation of the programmes. In this respect, the assessment committee was surprised to learn that the Educational Committee, in which students can play an important role, does not get a mention in the self-assessment report and fears that this exemplifies the invisible role the committee currently plays. From the information provided in the self-assessment report of the bachelor's programme, it concludes that the master programme Computer Science shares one Educational Committee (Opleidingscommissie) with all master programmes in the Graduate School of Natural Sciences. The programme also has its own Educational Advisory Committee (Opleidingsadviescommissie, OAC), an executive committee of the Educational Committee. Students in both committees should be elected, but the committee is unsure whether this currently is the case. From talking to the Educational Advisory Committee, the assessment committee concludes that this committee should position itself much more clearly and adopt a much more active role in the process of quality controle. Both the programme management and the OAC should realise that the

committee can help to identify problems (not only on a course level, but also at the level of the programme as whole) and to solve these problems. It advises the Educational Advisory Committee to develop a vision on the educational policy adopted in the programme and on its own role within the organization.

The curriculum as a whole is not evaluated. Students are asked to evaluate separate courses and action is taken if the evaluations show that a class is rated below average. Although the student association holds close ties with graduates, there are no systematic contacts with alumni. The committee thinks that after graduating, students should be asked to assess the programme: was it in line with their expectations? Which courses did they find helpful, and which less so? The committee expects that such evaluations will lead to identifying potential stumbling block in the composition of the programme and to formulating improvement measurements. It suggests that the programme could install a feedback group compiled of both students and graduates which would be periodically asked to function as a sounding board.

Considerations

The committee concludes that the contents and design of the curriculum are adequate to ensure that students can obtain the intended learning outcomes. However, it also concludes that the curriculum has a complicated structure, as the rules differ for each of the three programmes within the master degree programme. The committee is pleased with the possibility for students to set out their own study path. It concludes that this does place an urgent call for an intense level of study guidance.

The committee is satisfied with the teaching staff, in both quantitative and qualitative terms. The educational policy of Utrecht University encourages lecturers to obtain not only a basic, but also a senior teaching qualification (SKO in addition to BKO). This shows that it takes the quality of teaching seriously. The committee is impressed by the way in which the programme is continuously focussing on the improvement of the quality of teaching.

The committee concludes that completion rates are low, mainly because of a delay during the Research project. Appropriate solutions are being implemented to reduce this delay. The committee is confident that these solutions will contribute to the improvement of completion rates.

On two specific aspects of the teaching-learning environment the committee concludes that there is room for improvement. These entail study guidance (which is in the opinion of the committee too dependent on the work of the programme coordinator) and internal quality assurance. The Educational Advisory Committee should make itself much more visible in the programme, towards students as well as towards staff and programme management. Both parties should be aware that this committee can play an important role in contributing to the overall quality of the programme.

Conclusion

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

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

Assessment procedure
In the self-assessment report, the programme management describes its vision for the assessment procedure and the formal rules and quality assurance concerning assessment. Rules have been laid down in the Teaching and Examination Regulations (Opleidings- en Examen Regeling, OER), which is accessible for students and staff. The individual assessment procedure for each course is made clear at the beginning of each course and can be found in the study guide. The Board of Examiners of the Graduate School of Natural Sciences sees to it that the rules are followed and it checks the quality of assessment within the school. The master's degree programme Computer Science has its own Examination Subcommittee, which checks the quality of exams within the programme. The chair of the Subcommittee is also a member of the Board of Examiners. Both exam committees can benefit from the advice provided by the Assessment Advisory Committee (*toetsadviescommissie*) – established by the Science Faculty in 2011 as a centre of expertise regarding assessment and assessment-related didactics. The committee has looked at the thorough working procedure of the Board of Examiners, the Examination Subcommittee and the Assessment Advisory Committee and is satisfied that the quality control of examination is of a high standard. This is apparent, for example, from the practice of having examinations tested beforehand by a colleague, by the very active role played by the Examination Subcommittee and by organizing peer review sessions of five members of staff to discuss and assess the quality of thesis projects. The committee is also satisfied with the attention given to testing in the yearly assessment and development talks of the lecturers.

Assessment forms
The programme makes use of various assessment forms. Most courses are assessed with a final written exam at the end of the course, but oral presentations and writing assignments are also used. When students do not pass a course, they are allowed to take a resit if their final mark is at least a 4 (out of 10). The committee concludes that the various assessment forms tie in well with the intended learning outcomes.

Assessment procedure of master´s thesis

A special point of concern for the assessment committee is not only the supervision and considerable size (see standard 2) of the research project and subsequent master's thesis, but also its assessment. During the site visit, this issue was brought up in most meetings and discussed at great length. The master's thesis is assessed by the thesis supervisor and a second examiner, both members of staff, who give their marks independently. Summarizing its main objections, the committee would like to make two critical remarks on the current assessment procedure. The committee learned that the programme makes use of an Assessment Form composed by the Graduate School and standardized in the Science Faculty in 2011. In addition, teachers use another form, containing a set of ten rubrics for assessment, which was already in use in the master's programme and which staff generally consider a good point for reference. These two forms result in one final grade (composed of two grades: one for the thesis and one for a mandatory oral presentation), but differ slightly in composition. For instance, not all ten categories of the old form are represented in the new form. The committee understands that it takes some time before a new procedure is set in place. However, it also concludes that over the last years, possibly partly because there are currently two assessment forms in use, the Assessment Form of the Graduate School is often not filled in properly, resulting in grades for which it is not clear how they have been established. It strongly advises the programme to merge the two forms into one and to make sure that forms are filled in properly, digitalized and stored in a central place where they can be accessed by members of the Exam Subcommittee and other involved parties. In addition, the programme should make sure that the second examiner is able to judge the thesis independently. The committee appreciates that the programme management is aware of the problems and has made this one of their top priorities, and urges them to implement the necessary changes here soon.

3.2 Academic level achieved

Each member of the assessment committee has read three master's theses to see whether students achieve the intended learning outcomes. It concludes that the quality of the theses is good. In general, it agrees with the marks assigned to the theses and with the range of the grades. Theses that have been awarded a high mark, have often lead to publications. The committee has had some difficulties in checking how grades were established. Assessment forms were missing or only partly filled in. In some cases, the thesis had not been read and graded by a second assessor. The committee is optimistic that this will not happen again, once the assessment procedure has been formalized and streamlined.

From studying the information provided in the self-assessment report, the committee concludes that graduates have no trouble finding a job, often in research. Graduates of the GMT-programme often find a position in the gaming industry. The committee concludes that this shows that graduates have achieved the intended learning outcomes.

Considerations

The committee concludes that the system of testing is adequate. The examinations in the programme are varied and match the learning objectives. Students are well informed about assessment procedures. The introduction of a new Assesment Form, provided by the Graduate School for the assessment of the thesis project, should lead to more clarity on what the final grade is based on. This form, the committee concludes, needs to be better implemented and better formalized.

The committee is impressed by the active role taken by the Board of Examiners, the Exam Subcommittee and the Assessment Advisory Board.

To assess the level achieved by the master students of Computer Science, the committee examined a range of master's theses. It concludes that the final level of the master projects is generally high and matches with what can be expected of a graduate of the master's research programme in Computer Science.

Conclusion

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

General conclusion

In the committee's judgement, the master's programme Computer Science at Utrecht University fulfils the criteria for accreditation. It has noted many positive aspects and suggested several points for improvement. It is confident that the programme management will continue to improve the quality of its teaching-learning environment and the assessment procedure for the master's theses.

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

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 doctorate 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 doctorate 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 doctorate 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. Dr. Sjouke Mauw is professor in Security and Trust of Software Systems at the University of Luxembourg since 2007. He studied mathematics at the University of Amsterdam and did a PhD in Computer Science at the same university. He was assistant professor at the University of Amsterdam (1988) and Eindhoven University of Technology (1992). In 1999 he became associate professor in Eindhoven. As a researcher he was also related to the CWI in Amsterdam. Sjouke Mauw is head of a research group focussing in formal methods in the areas of security en trust. He has also published on several other subjects like proces algebra, domain specific languages, testing, distributed algorithms and bio-informatics.

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 Eindhoven University of Technology. 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 study 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

Learning outcome in general
The Dublin descriptors indicate in general terms what levels a student should reach in knowledge and understanding, the application of knowledge and understanding, forming judgments, communication and learning skills to award him the master's title. In the objectives and content of a Master's degree module it must be clear that teaching and assessment of students aims at reaching the goals set in the Dublin descriptors. They are as follows.

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.

Domain specific contents, the nature of Master degree modules
The Master's degree module 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 degree 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 module will generally concentrate on subjects in a limited specialisation within the field, or in the border region with adjacent fields. If the module 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 modules have identified a (international) community of modules of a similar nature and they will fit the standards of that community.
The Master's degree module 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 module and research activities, and researchers are active as lecturers and supervisors in the degree module.
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

[1] 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.

degree module there will be a final project that takes at least one quarter of the entire module. In the final project the student can show his capabilities in each of the five fields of the Dublin descriptors (knowledge and understanding, application of knowledge and understanding, forming judgments, communication and learning skills).

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 module 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 module 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 modules to have sufficient contacts within trade and industry.

Appendix 3: Intended learning outcomes

The OER specifies that after completing the programme, the student is supposed to comply to the 14 competences below:

Knowledge and understanding

1. can use his or her knowledge of computer science to make a substantial contribution to the development and/or application of scientific concepts and methods, often in a research context;
2. is capable of understanding important recent developments in computer science, and of indicating their implications for society and the research field;
3. is capable of interpreting and using specialized literature in the field of computing science;

Applying knowledge and understanding

4. is capable of translating a problem from the area of computer science or an application into a research question that is relevant to and suited for scientific development, product development or education;
5. is capable of translating this research question into an appropriate research plan in accordance with the required scientific and methodological standards;
6. is capable of independently performing this research with the required care and ethical responsibility and to process, interpret and evaluate the empirical data and other outcomes thus obtained in the appropriate manner;

Judgement

7. is capable of discussing the outcomes of empirical and theoretical research and to relate them to the current scientific state-of-the-art and literature;
8. is capable of indicating the relevance of this research to the solution of problems in the area of computer science, also from the viewpoint of society wherever possible;
9. has the capability to reflect critically on his or her own efforts as a researcher in the area of computer science from the viewpoint of society;

Communication skills

10. is capable of clearly communicating the results of research, in writing as well as orally, to an audience of specialists and laymen, in an international context;
11. is capable of functioning effectively in a research team of possibly multi-disciplinary composition;

Learning skills

12. has the capability to evaluate his or her own learning- and development process during the study, and if necessary to motivate and adjust his- or herself;
13. has acquired an effective and result driven way of working that allows him or her to function independently in a competitive labor market;
14. has the qualification to obtain a PhD position as well as a job in business and industry.

Appendix 4: Overview of the curriculum

The overall structure of the degree programme is that the first year is spent on a diversity of courses (7.5 EC each, so 8 of them in total). In the second year there are two more courses, but three quarts of it is dedicated to a large research project.

The format of the graduate school allows for

- mandatory courses, mandatory for all participants in a programme;
- primary electives, which must be chosen from a limited list of courses specifically targeted to the programme;
- secondary electives, which can be chosen from a larger collection;
- research part, in which an individual reserch project is carried out, leading to a master thesis.

Although programmes in physics and mathematics have mandatory courses, the degree programme does not use this category. The reason for this is that in the broad range of subjects in computer science, none of them is inherently more important than the others, and all necessary foundations have been laid in the bachelor phase.
The number of electives varies slightly per programme. Course election is not entirely free for the student: it has to be done in agreement with the programme coordinator, who sees to it that the elected courses form a coherent set that is a useful preparation for a thesis project.
The secondary electives are further subdivided in a part where courses can be chosen from the union of courses from all three programmes, and a part where courses from other programmes can be chosen (e.g., information science, or mathematics) to add an interdisciplinary touch to the study. The latter category can also be used for deficiency courses that were prescribed by the programme coordinator on an individual basis. It is strictly limited to 15 EC, to ensure that at least 60 EC are spent within Computer Science.

A small (7.5 or 15 EC) Experimentation project can be part of the secondary electives. An experimentation project provides an opportunity for students to learn how to set up and carry out algorithmic experiments, and to evaluate and report the results, or an opportunity to implement certain advanced software techniques and to evaluate the implementation. Experimental research requires a methodological approach: research goals and hypotheses need to be defined unambiguously, experiments need to be designed in a goal-oriented way, experimental results should be statistically significant, and conclusions must be well-justified. An experimentation project is usually carried out internally, and is supervised by a staff member.

In the GMT programme, such a project is mandatory, which explains that the `research' category is bigger here, at the expense of the secondary electives category. The CS and TAI programmes encourage students to take at least one Seminar. A seminar (7.5 EC) is intended to take students to explore deeper into selected research themes, typically by studying recent papers in a small group. The themes may vary, parallel with the current research interest of the academic staff. Examples of seminars given in the last few years: Social simulation (2013), Computational Sustainability (2013), Dependently Typed Programming (2011{13), Algorithms, Games and the Internet (2011), Advanced Compiler Construction (2010).

Throughout the year there is a continuously running Colloquium series for each programme. Talks are given by the students themselves, but also by staff and guest speakers, covering recent research. Throughout his study, each student is required to attend at least a minimum

number of talks, and to give one himself. Also, student's thesis defenses are often part of the colloquium programme.
The Colloquium gives an opportunity for students to be informed of other areas outside their own study line, and also to keep up with the latest developments in Computing Science. There is no strict order in which the courses are to be taken, which allows for some flexibility in individual situations. Also, this modular design enables an entry point not only in September, but also in February. Courses are scheduled in such a way that students starting in September encounter them in an arguably `natural' order. In practice, students compose their study programme in consultation with the programme coordinator.

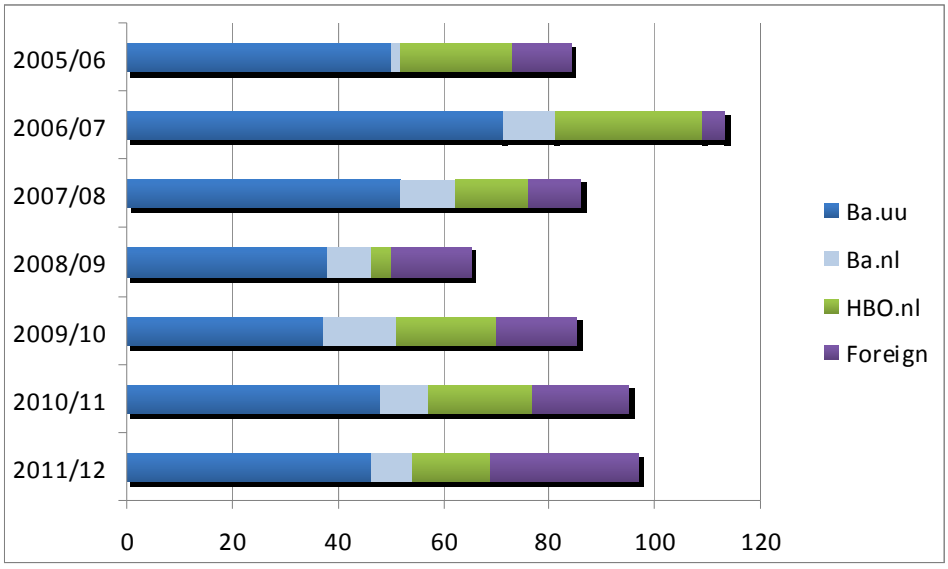
The last part of the master degree programme for a student is the research project. Integral parts of the research project are the (writing of) the master thesis and a presentation at the end of the project.

Appendix 5: Quantitative data regarding the programme

Data on intake, transfers and graduates

Intake Master's degree programme Computer Science

	Intake	By previous education				By gender				By start date	
year	total	Ba.uu	Ba.nl	HBO.nl	Foreign	M#	F#	M%	F%	Sept	Febr
2005/06	84	50	2	21	11	82	2	98%	2%	44	40
2006/07	113	71	10	28	4	107	6	95%	5%	78	35
2007/08	86	52	10	14	10	81	5	94%	6%	67	19
2008/09	65	38	8	4	15	56	9	86%	14%	54	11
2009/10	85	37	14	19	15	77	8	91%	9%	63	22
2010/11	95	48	9	20	18	84	11	88%	12%	61	34
2011/12	97	46	8	15	28	89	8	92%	8%	76	21

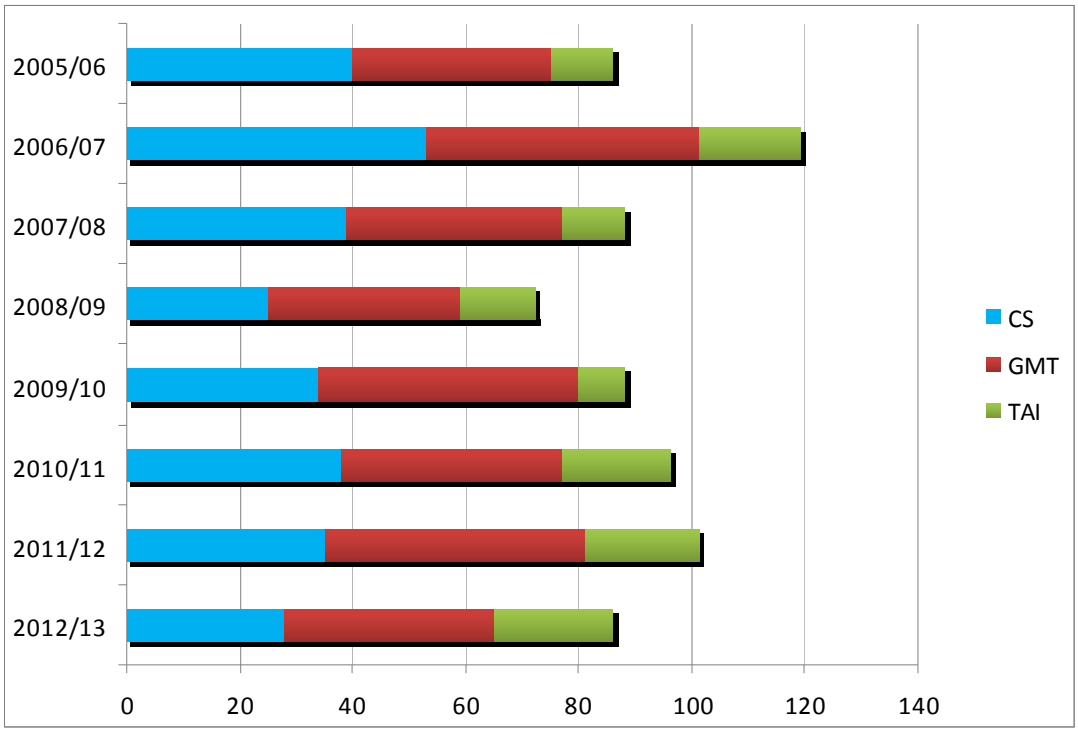


Intake by programme

Cohort	Intake total	By program CS	GMT	TAI
2005/06	86	40	35	11
2006/07	119	53	48	18
2007/08	88	39	38	11
2008/09	72	25	34	13
2009/10	88	34	46	8
2010/11	96	38	39	19
2011/12	101	35	46	20
2012/13	86	28	37	21

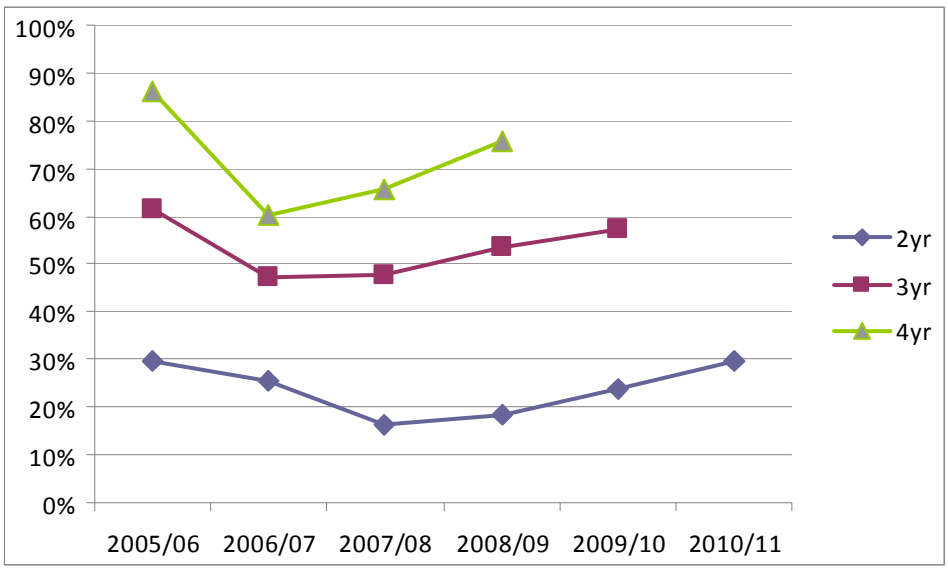
source: UU student administration

totals differ slightly from KUO numbers



Yield

Start Year	Intake Total	Intake Sept	Cumulative # graduated 1yr	2yr	3yr	4yr	Cumulative % graduated 1yr	2yr	3yr	4yr
2005/06	84	44	1	13	27	38	2%	30%	61%	86%
2006/07	113	78	7	20	37	47	9%	26%	47%	60%
2007/08	86	67	2	11	32	44	3%	16%	48%	66%
2008/09	65	54	0	10	29	41	0%	19%	54%	76%
2009/10	85	63	0	15	36		0%	24%	57%	
2010/11	95	61	1	18			2%	30%		
2011/12	97	76	0				0%			



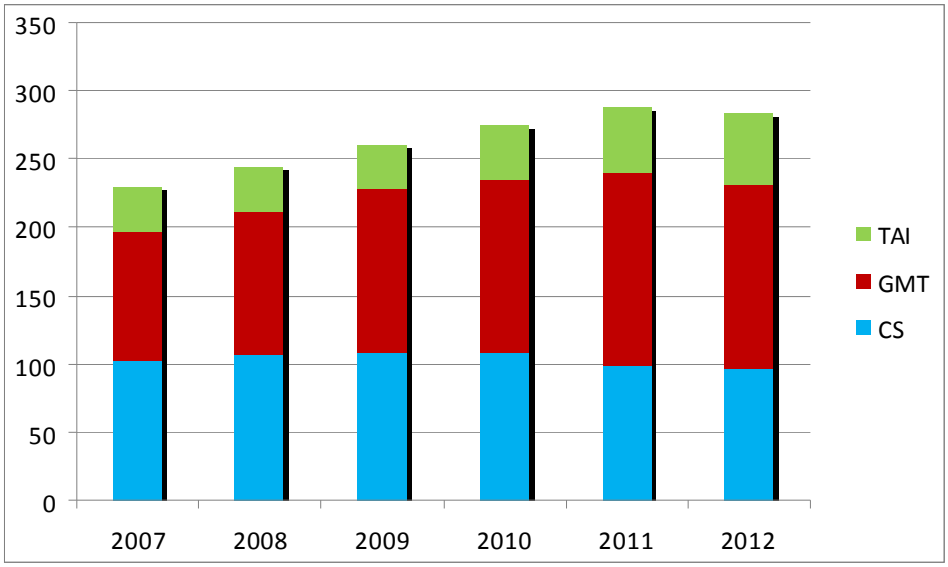
Study length

Grad.n	# by previous education					Average study length in months Master					Ba+Ma
Year	Total	Ba.uu	Ba.nl	HBO.nl	Foreign	avg	Ba.uu	Ba.nl	HBO.nl	Foreign	Ba.uu
2003/04	3			1	2	23			22	24	
2004/05	10	2		5	3	21	5		26	23	76
2005/06	15	4	2	7	2	23	3	33	32	23	75
2006/07	42	27	2	8	5	18	13	31	30	24	76
2007/08	46	28	3	13	2	26	22	34	33	32	73
2008/09	55	41	1	8	5	32	32	28	37	30	80
2009/10	57	33	8	8	8	33	33	35	39	27	84
2010/11	63	35	11	4	13	36	39	33	43	29	84
2011/12	65	38	6	10	11	35	34	33	44	31	78

Grey numbers are not meaningful because Ba/Ma was in transition at the time

Number of students per programme

Programme	2007	2008	2009	2010	2011	2012
CS	103	107	109	109	100	96
GMT	95	106	120	127	140	136
TAI	32	32	31	40	48	52
total	230	245	260	276	288	284



Teacher-student ratio achieved

	2008	2009	2010	2011	2012
# staff (teaching-fte)	8,75	7,80	6,84	6,90	8,24
# student	245	260	276	288	284
student : staff ratio	28,0	33,4	40,4	41,7	34,5

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

Weighed avg contact hours/wk/course 4,41

Appendix 6: Programme of the site visit

Visitatie informatica Universiteit Utrecht, 19 en 20 september 2013

donderdag 19 september

12.00	12.30	aankomst commissie	
12.30	13.00	lunch commissie	
13.00	14.15	voorbereiding commissie	
14.15	14.30	presentatie Softwareproject 1	
		dr. Frans Wiering	begeleider "photo album for iPad"
		drs. Thijs van Schadewijk	opdrachtgever "photo album for iPad"
		Rick Barneveld BSc.	deelnemer "photo album for iPad"
14.35	14.50	Mihai Polak	BSc. deelnemer "modified shuttle test"
14.15	14.30	presentatie Softwareproject 2	
		dr.ir. Marjan van den Akker	coördinator Softwareproject
		Frank van Houten BSc.	deelnemer "simulation game"
		Matthijs van Herwijnen BSc.	deelnemer "simulation game"
14.30	14.50	dr. Marinus Veldhorst	begeleider "motion editor"
		Geertièn de Vries BSc.	deelnemer "motion editor"
15.00	16.00	management	
		dr. Hans Bodlaender	programmaleider master Computing Science
		dr.ir. Arjan Egges	programmaleider master Game and Media Technology
		prof.dr. John-Jules Meyer	programmaleider master Technical Artificial Intelligence
		drs. Jeroen Fokker	opleidingsdirecteur bachelor Informatica
		drs. Lennart Herlaar	onderwijsmanager
		prof.dr. Mark Overmars	hoofd departement Informatica
16.00	17.00	Studenten Ba+Ma	
		Jesse de Ruijter	student bach.3e jaar Alg.Inf.
		Bas Hoogeboom	student bach.2e jaar Gametech
		Paul Bijenhof	student bach.4e jaar
		Michelle Meekes BSc.	student master Computing Science
		Tigran Gasparian BSc.	student master Game&Media Technology
		Jordy van Leersum BSc.	student master Technical Artificial Intelligence
17.00	17.30	Alumni	
		Roel Wijgers MSc.	(MSc 2007) Consultant at CQM Product & Process Improvement
		Jeroen van Wolffelaar MSc.	(MSc 2010) OR engineer at Ortec
		Jacob Kleerekoper MSc.	(MSc 2007) Functional designer at PGGM
		Joost van Dongen MSc.	(MSc 2009) Lead programmer at Ronimo games
		Sjoerd Timmer MSc.	(MSc 2012) AiO at Universiteit Utrecht
		Jonas Koperdraat MSc.	(MSc 2012) Software engineer at Quinity
17.30	18.00	intern overleg commissie	

vrijdag 20 september

09.00	10.00	Docenten	
		dr.ir. Marjan van den Akker	docent en coördinator Softwareproject
		dr.ir. Jan Broersen	docent
		dr. Ad Feelders	docent
		dr. Wolfgang Hürst	docent
		prof.dr. Johan Jeuring	docent en voorz. Toetsadviescommissie
		prof.dr. Marc van Kreveld	docent
		dr.Wouter Swierstra	postdoc en junior docent
10.00	10.30	Opleidingscommissie	
		dr. Roland Geraerts	voorz.OAC master
		dr. Peter de Waal	voorz.OAC bachelor
		dr. Jurriaan Hage	docentlid OAC master
		Wouter Uijens	studentlid OAC bachelor
		Joran Minjon BSc.	studentlid OAC bachelor
		Judith Stoef BSc.	studentlid OAC master
10.30	11.15	examencie en studieadviseur	
		dr. Gerard Tel	voorz. Deel-Examencommissie
		dr. Wishnu Prasetya	lid Deel-Examencommissie
		Corine de Gee	studieadviseur
		dr. Ferdi Engels	voorz. Examencommissie bachelor
		dr. Celso de Mello Donega	voorz. Examencommissie master
11.15	11.45	open spreekuur	
11.45	13.00	lunch en intern overleg commissie	
13.00	13.45	eindgesprek management	
		dr. Hans Bodlaender	programmaleider master Computing Science
		dr.ir. Arjan Egges	programmaleider master Game and Media Technology
		drs. Jeroen Fokker	opleidingsdirecteur bachelor Informatica
		drs. Lennart Herlaar	onderwijsmanager
		prof.dr. Mark Overmars	hoofd departement Informatica
		prof.dr. Henry Prakken	prog.coord. Technical Artificial Intelligence
		prof.dr. Rens Voesenek	vice-decaan onderwijs Betafaculteit
		prof.dr. Huib de Swart	voorz. Graduate School Natural Sciences
		dr. Gerrit Heil	voorz. Undergraduate School Betafaculteit
13.45	15.30	intern overleg commissie	
15.30	16.00	mondelinge rapportage	
16.00	16.30	borrel	

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:

0224103	3117456	3336727
9908005	3137708	3019780
3458695	3241106	3611817
3701573	3252272	0345369
3427773	3137759	3120805

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):

- Standard / basic books
- Course dossiers, including tests, assessment criteria, assessment forms and answers
- Minutes of the Board of Examiners 2009-2011
- Minutes of het Educational committee 2009 – 2011
- Course evaluations

Appendix 8: Declarations of independence

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ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM:
Dhr. Jan Paredaens

PRIVÉ ADRES:
K Karellaan 42
B-1982 ELEWIJT

IS ALS DESKUNDIGE (voorzitter) / ~~SECRETARIS~~ GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Informatica

AANGEVRAAGD DOOR DE INSTELLING:

TU Delft; Open Universiteit; Rijksuniversiteit Groningen; TU Eindhoven; Universiteit Utrecht, Radboud Universiteit, Universiteit Leiden; UvA/VU; Universiteit Twente

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;

1

nvao
nederlands - vlaamse accreditatieorganisatie

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

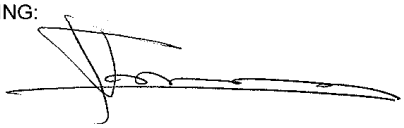
VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

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

PLAATS: Antwerpen

DATUM: 26.4.13

HANDTEKENING:



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ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Sjouke Mauw

PRIVÉ ADRES:

20, RUE TH. GILLEN
L-1625 HOWALD LUXEMBURG

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

INFORMATICA

AANGEVRAAGD DOOR DE INSTELLING:

VSNU/QANU
RUG, TUE, UU, UvA, VU

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;

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nederlands - vlaams accreditatieorgaan

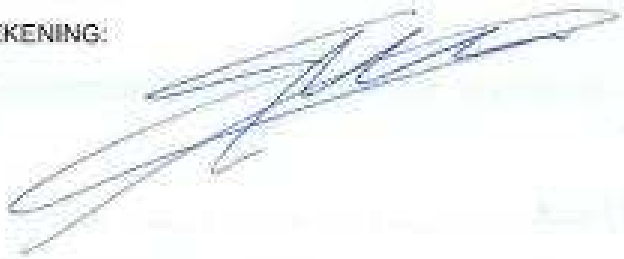
VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

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: Luxemburg DATUM: 3/4/13

HANDTEKENING:



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nederlands-vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM:
Dhr. Koen de Bosschere

PRIVÉ ADRES:
Park ter Linden 3

9090 Melle

België

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

Informatica

AANGEVRAAGD DOOR DE INSTELLING:

TU Delft; Open Universiteit; Universiteit Utrecht; Radboud Universiteit

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;

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nederlands - vlaamse accreditatieorganisatie

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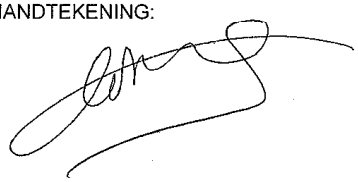
VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Antwerpen. DATUM: 26/4/2013

HANDTEKENING:



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ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Sape J. Mullender

PRIVÉ ADRES: Prinsengracht 797
1017 KA Amsterdam

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

B Informatica
M Informatica

AANGEVRAAGD DOOR DE INSTELLING:

Universiteit Utrecht

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;

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nederlands - vlaamse accreditatieorganisatie

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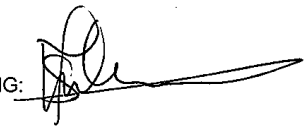
VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: ANTWERPEN DATUM: 4-4-2013

HANDTEKENING: 

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ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Ruud Valkij (Ruud Verbij)

PRIVÉ ADRES: Borstelweg 40, Enschede

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

alle informatica (BSc en MSc) aan:

AANGEVRAAGD DOOR DE INSTELLING:

UVA/VU, OU, TU Delft, UU,

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;

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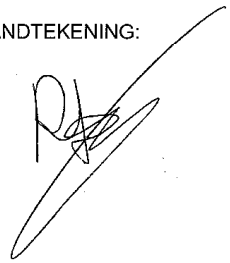
VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Antwerpen.

DATUM: 26-4-13

HANDTEKENING:



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nederlands - vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM:
Liza Kozlowska

PRIVÉ ADRES:
Bruyningslaan
2273 KT Voorburg

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

Informatica

AANGEVRAAGD DOOR DE INSTELLING:

TU Delft; Open Universiteit; Rijksuniversiteit Groningen; Universiteit Utrecht; Radboud Universiteit

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;

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nederlands-vlaamse accreditatieorganisatie

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

PLAATS: Utrecht

DATUM: 1 mei 2013

HANDTEKENING: