NVAO • THE NETHERLANDS

INITIAL ACCREDITATION

WO-BACHELOR

BSC COMPUTER SCIENCE

Universiteit Maastricht

FULL REPORT

24 JUNE 2022

Contents

1 Peer review

The Accreditation Organisation of the Netherlands and Flanders (NVAO) determines the quality of a new programme on the basis of a peer review. This initial accreditation procedure is required when an institution wishes to award a recognised degree after the successful completion of a study programme.

The procedure for new programmes differs slightly from the approach to existing programmes that have already been accredited. Initial accreditation is in fact an ex-ante assessment of a programme. Once accredited the new programme becomes subject to the regular review process.

The quality of a new programme is assessed by means of peer review. A panel of independent peers including a student reviews the plans during a site visit to the institution. A discussion amongst peer experts forms the basis for the panel's final judgement and the advisory report. The agenda for the panel visit and the documents reviewed are available from the NVAO office upon request.

The outcome of this peer review is based on the standards described and published in the limited NVAO Assessment framework for the higher education accreditation system of the Netherlands (Stcrt. 2019, nr. 3198). Each standard is judged on a three-point scale: meets, does not meet, or partially meets the standard. The panel will reach a conclusion about the quality of the programme, also on a three-point scale: positive, conditionally positive, or negative.

NVAO takes an accreditation decision based on the full report. Following a positive NVAO decision with or without conditions the institution can proceed to offer the new programme.

This report contains the findings, analysis and judgements of the panel resulting from the peer review. It also details the commendations as well as recommendations for follow-up actions. A summary report with the main outcomes of the peer review is also available.

Both the full and summary reports of each peer review are published on NVAO's website www.nvao.net. There you can also find more information on NVAO and peer reviews of new programmes.

Because of COVID-19 temporary measures apply for this peer review.

2 New programme

2.1 General data

Institution	Universiteit Maastricht
Programme	Wo-bachelor BSc Computer Science
Variants	Fulltime:
Degree	Bachelor of Science
Tracks	NA
Locations	Maastricht
Study load	180 EC[1]
Field of study	Natuur

2.2 Profile

The bachelor's programme in Computer Science delivers graduates able to solve complex computer science problems, think analytically and cooperate in diverse teams in an international setting. They can adapt to ongoing developments within the field of computer science and the ICT sector and can develop and apply ICT technology in an academic, professional and societal context.

2.3 Panel

Peer experts

- Prof. dr. ir. Inald Lagendijk (*chair*), is Distinguished Professor in Computing-based Society at Delft University of Technology;
- Prof. dr. Lejla Batina, is full professor Digital Security and Director of Education, Institute for Computing and Information Sciences at the Radboud University;
- Dr. John Schavemaker, Technical Fellow at PTC Vuforia R&D and previous Computer Vision Field Lead;
- Ruward Karper (*student-panel member*), master student of the Joint Master Data Science & Entrepreneurship, at Eindhoven University of Technology and Tilburg University.

Assisting staff

Dr. Meg van Bogaert (secretary)
Karin Barendregt (NVAO policy advisor and process coordinator)

Site visit

17 May 2022 (online procedure)

[1] European Credits

3 Outcome

The NVAO approved panel has reached a positive conclusion regarding the quality of bachelor's programme in Computer Science offered by Maastricht University. The programme complies with all standards of the NVAO limited framework.

The initiation of this programme was based on the need for computer scientists in the field, which subsequently led to the current profile: a computer scientist with knowledge, expertise and skills in computer science complementary to those of the graduates of the already existing Data Science Artificial Intelligence (DS-AI) bachelor's programme. The panel finds this a good approach to the profile, although the distinction between the two programmes in documentation and communication should be emphasised more strongly. The Intended Learning Outcomes (ILOs) are of the right level and orientation but could more explicitly emphasise the computer science aspects of the programme including for example systems and responsible computer science aspects). The involvement of the Education Advisory Board (EAB) is impressive, resulting in a strong relationship with the (future) professional field. The EAB was invited to provide input on several occasions, after which suggestions were implemented.

The teaching and learning environment has many positive aspects: a good team of lecturers, a clear didactic concept that integrates theory and application, the international classroom and student guidance. The curriculum is solid and contains all the aspects that belong in a Computer Science bachelor's programme. The structure of the curriculum is clear, although the panel recommends making several aspects more explicitly visible, for example by means of learning lines. As with the profile and the ILOs, the panel emphasises that the computer science specific elements of the curriculum should be more distinctive compared to the DS-AI bachelor's programme on offer.

The programme has a good system of assessment, making use of the considerable expertise within the department and faculty. Procedures concerning assessment and the associated quality assurance are in order. Variation in assessment methods is strived for, whereby the initiative lies with the examiner and the check is at the programme level. When expanding the Assessment Committee, the panel advises to increase the representation of computer science experts.

The stakeholders involved in setting up this well-designed Computer Science bachelor's programme are enthusiastic, committed, and knowledgeable. This applies to the management, lecturers, examination board and the professional field. The extensive experience within the faculty and department in setting up and running educational programmes ensures that Computer Science can, in some respects, 'hit the ground running'. This is a great advantage, although there is the potential risk of taking the introduction of a new programme too lightly. In conclusion, the panel's assessment of the Computer Science bachelor's programme is positive and the panel provides a number of recommendations for further development and finetuning.

Standard	**Judgement**
1. Intended learning outcomes	meets the standard
2. Teaching-learning environment	meets the standard
3. Student assessment	meets the standard
4. Achieved learning outcomes	NA
Conclusion	*Positive*

4 Commendations

The programme is commended for the following features of good practice.

1. The programme clearly meets a need for computer scientists in the professional field. The Intended Learning Outcomes (ILOs) – though general – are clear and relevant for a bachelor's degree in Computer Science. The ILOs emphasise the importance of the fundaments (mathematics and science), pay attention to applications and societal relevance and a combination of hard skills and soft skills that are essential for future software engineers.

2. The panel is impressed by the strong involvement of the professional field by way of the Education Advisory Board (EAB). Regular participation of the EAB in the development of the programme ensures a broadly supported curriculum with room for both academia and application.

3. The Computer Science bachelor's programme is a diverse and international programme that includes knowledge and skills. The international classroom and the Project Centred Learning (PCL) approach both support and strengthen this approach.

4. The system of assessment, including procedures, assessment plan and quality assurance of assessment, is well organised. A variety of assessment methods is in place, including a balance between individual and group assessment.

5. The bachelor's thesis is to be written in the format of a scientific article and scheduled with a public presentation. The thesis is assessed by means of a clear and comprehensive rubric.

6. The panel commends the commitment and enthusiasm of all stakeholders involved in the initiation, development, and execution of this bachelor's programme.

5 Recommendations

For further improvement to the programme, the panel recommends the following actions:

1. Profile and ILO's – Refine and make the computer science profile more explicit to emphasise the distinction from the department's other bachelor's programme (DS-AI). Include this profile in the communication to internal and external stakeholders. In line with this, the panel suggests explicitly including computer-science aspects in the ILOs.

2. Curriculum - In terms of content, the curriculum contains the right themes and topics. A number of aspects, specifically relevant to computer science, could be made more explicitly visible in the curriculum, e.g., in learning lines. The panel suggests, for example, system aspects, security, and responsible computer science.

3. Quality assurance – Although stakeholders involved in the development of the programme are experienced and the department and faculty have good structures and procedures. The programme should be aware of issues that may arise, for example the need for practice-oriented examination methods for software engineering and security courses, software plagiarism, and staying in close contact with students and staff to organise the possibility of quick interventions.

4. Computer Science expertise – Ensure that sufficient - and appropriate - computer science expertise is in place. This applies to lecturers, an issue programme management is currently addressing, but also to the expertise in, for example, the Assessment Committee (AC).

6 Assessment

6.1 Standard 1: Intended learning outcomes

The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

Judgement
Meets the standard.

Findings, analysis, and considerations
In shaping and maintaining effective and innovative economies, there is a need for ICT specialists who can integrate technological solutions with the broader societal context, as well as predict and analyse the effects of ongoing digitisation. The bachelor's programme in Computer Science (CS) is designed to educate these professionals by offering a solid background in fundamental computer science, software development and mathematics. The CS programme delivers graduates who can solve complex computer science problems, think analytically and cooperate in diverse teams within an international setting. They can adapt to ongoing developments within the field of computer science and the ICT sector and can develop and apply ICT technology in an academic, professional, and societal context. During the programme, students acquire and apply knowledge, understanding and skills in fundamental computer science and software development, grounded in a solid mathematical foundation. The panel appreciates the value that is given to fundamental mathematics and sciences as well as the attention to applications, and internationalisation.

Throughout the site visit, the panel discussed the profile of the CS programme and – in particular – the distinctiveness to the other bachelor's programme in the Department of Data Science and Knowledge Engineering (DKE), namely Data Science & Artificial Intelligence (DS-AI). The development of the CS programme was based on an expressed need from the professional field, which indicated the need for graduates with knowledge and skills that complement those of DS-AI graduates. This knowledge and skills should include subjects like system knowledge, security and privacy, hardware, and technical skills. Furthermore, the Maastricht computer scientist must be able to stand at the centre of a computer science process and integrate knowledge of experts from different fields such as data science and AI, security, and system engineering. According to the panel, the profile that emerged from the interviews was clear, but was not worded clearly enough in the documentation. The explicit distinction between the DS-AI and the CS programme is important, also for prospective students (to help them make an informed choice) and the professional field. Although the developers of the programme seem aware of the issues described in this paragraph, the panel recommends formulating the profile more precisely, including the distinctiveness between the two bachelor's programmes in the department.

The programme formulated five clusters of intended learning outcomes (ILO's):

1. Possess a strong foundation in the fundamentals of computer science including software development skills, combined with a solid foundation in mathematics and algorithms.
2. Exhibit sufficient knowledge and insight to be able to use new methodologies such as those derived from high-performance computing, IoT, cybersecurity, data science & AI, and human-machine interaction.
3. Be able to analyse, organise and solve important ICT challenges for various application domains, both individually and as a team.
4. Be environment-oriented by considering the societal context to implement ICT solutions in organisations.
5. Display and maintain broad competencies that are important for the computer scientist of the future, such as (international) cooperation, dealing with diversity, communication, leadership, and the independent and adaptive design of one's own learning process, now and in the future.

The 21 ILOs are in line with the Dublin Descriptors, with the Association for Computing Machinery (ACM) International framework and the national ICT top sector. The format of the ILO's is in line with the other programmes offered at DKE. According to the panel, the ILOs are relevant, of the right level and orientation and in line with the international requirements for an academic MSc programme. At the same time, the ILOs are very general and the panel recommends including subjects, such as systems thinking, security, multidisciplinarity and responsible computer science, more explicitly in the ILOs.

The DKE Educational Advisory Board (EAB) was involved in discussing the format and curriculum of the bachelor's programme. Additional feedback was collected through existing relationships in the professional field at the crossroads between AI and CS. The CS programme has also been discussed with the representatives of the Brightlands Campus that will host the elective internship project as part of the third year's minor.

The panel is impressed by the EAB, how it functions and the way it is involved by DKE to develop a good educational programme that meets the wishes and needs of both the professional field and academia. In speaking to six members of the EAB, the panel encountered a group that is well attuned to each other and well informed and involved in developments in education. At various points in the development process of the CS programme, the EAB's input was requested, and the development team incorporated the feedback into the plans. According to the panel, a rotation schedule for the EAB can ensure that the broad range of the professional field is well represented.

In conclusion, the panel believes that the profile and ILOs meet the requirements for a bachelor's programme in Computer Science. The active and involved EAB ensures a good embedding in the (regional) professional field and academia. The recommendations of the panel concern a sharper formulation of the computer science profile, to emphasise the distinction with the DS-AI programme and a more explicit definition of a number of aspects in the ILOs to better reflect the factual content of the curriculum.

6.2 Standard 2: Teaching-learning environment

The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

Judgement
Meets the standard.

Findings, analysis, and considerations

Curriculum
The full-time curriculum of 180 EC is divided into six semesters and is based on the Project Centred Learning (PCL) approach. The curriculum is aligned with the guidelines of the ACM framework, including a number of theoretical topics. Students are offered a solid mathematical foundation and experience the scientific process during the semester projects. These projects are formulated as research projects where the tasks involved problem solving, analysing, and interpreting results and drafting a scientific report. Year 1 consists of twelve compulsory courses and two projects and includes three learning lines: 1) learning to programme, 2) developing a strong basis in mathematics, and 3) general computer science topics. In year 2, the curriculum is aimed at broadening the knowledge of students with ten mandatory computer science courses. Two elective modules allow students to acquire knowledge and insight to new computer science technologies by deepening their understanding. During the first semester of year 3, students are offered elective courses that are combined with a project at one of the Brightlands Campuses. This allows students to engage in a real-world project, as one of the company supervisors will act as a project client. Students can also use this semester to study abroad at one of the partner universities or participate in a Maastricht University minor. The final semester is focused on the Bachelor thesis, which is considered the culmination of the degree programme. This semester also includes three courses.

An Honours Programme is offered, similar to the current KnowledgeEngineering@Work in the DS-AI programme. Students are placed at a company or organisation in the region and work on an individual project in years 2 and 3 as part of an internship. These students also dedicate their thesis to a topic relevant for the internship company or organisation.

Of the three courses in the final semester of the programme, the panel finds both *Operating Systems* and *Theoretical Computer Science* logically positioned. In these integrative courses, students learn how topics in the curriculum are related and deepen their understanding. The reason for placing the third course, *Ethics and Philosophy*, at the end of the curriculum, is that the students must be mature enough to grasp this subject properly. The panel partly agrees with this argumentation, although it holds the opinion that this extensive course is placed very late and in isolation. It is important that students recognise and learn to deal with all aspects of responsible computer science – and not only the ethical aspects – from day one. The panel recommends that the

subjects of ethics, legal and social aspects that are central to responsible engineering, should be dealt with in a more integrated manner throughout the curriculum.

The panel is of the opinion that both the content and the structure of the curriculum meet that of a Computer Science bachelor and established that the curriculum covers the ILOs. The curriculum focuses on mathematics, algorithms, and programming courses in year 1, laying strong fundaments. In the later years, there is ample choice in elective courses. The one remark by the committee is that the rich content of the curriculum is not readily apparent. The panel noted that a number of substantive elements, for example thinking in terms of computer science aspects of system engineering, are somewhat fragmented and hidden in courses. The panel recommends making these elements more visible, as well as the build-up in level and complexity. This can be done, for instance, by means of learning lines.

Didactic concept
Education at UM is built upon the principles of Problem-Based Learning (PBL), which is 1) a collaborative process, 2) constructive learning in a 3) relevant context in which 4) self-directed learning is central. This method and small-scale set-up of education enhances the personal and skills development. The CS programme will apply a closely related version of this concept, which is also used in the DS-AI programme, called Project-Centred Learning (PCL). By using PCL, groups of students tackle challenging problems in semester long projects, applying and integrating knowledge and insights from courses. This helps the students to develop the skills and competencies to contribute to ICT solutions in a practical and professional context. A particular set of skills is provided in each project, covering three themes (software development skills, project management skills and collaboration skills). For this, students are offered a variety of skills classes. Students are provided with the experience of working in a team on projects that are too complex for one person in the time available. Over the years, all aspects of the medium- to large-scale projects are executed by the students. Two examiners are involved to realise the integration of different expertise of knowledge. The examiners design and develop a problem case and indicate the topics to be explored. During the project, the examiners provide feedback to student groups. In weekly meetings, the project tutor guides students through the process and keeps track of planning, tasks, and procedures.

On the basis of the fully elaborated project in the first semester of year 1, the panel concludes that the projects truly enhance integrative activities that reflect the content of the parallel courses. It allows for a good balance between theory and practical applications. Furthermore, the panel appreciates the long-term internal and external (e.g., Brightlands Campus) stakeholders involved in the PCL-approach. The panel understands that the topics of the projects in the first year cannot be too extensive or complex. Nevertheless, the panel recommends to steer away from typical DS and AI topics for the projects.

The chosen educational model and the associated small-scale education mean, among other things, that students are intensively supervised. According to the panel, the expected enrolment numbers make high-quality education possible. However, the panel emphasises the importance of being able to anticipate a larger intake and the sustainability of the educational model.

International classroom and instructional language
The international orientation and focus of the programme, reflected in the ILO's and the PCL teaching model, support the use of an international classroom. The panel finds the motivation for the English name and English-language education convincing. The strong international character as well as (cultural) diversity are important at UM, but also for the development of the future computer scientist who must be able to operate and function in a global context. The main labour market for Computer Science graduates includes the entire ICT sector, which has evolved towards the use of English as the primary language of communication.

In the international classroom students work in an interdisciplinary and international context. They work in small groups, coming from diverse cultural backgrounds and with various international experiences. In the international classroom setting, teaching and examinations are conducted in English, enhancing the preparation of students to work in interdisciplinary and international teams.

The panel is positive about the proposed plans to shape education in an international classroom setting. Regional at UM is easily equivalent to international, which fits well with the international classroom. The international intake at DKE is diverse and by randomly placing students in groups, an international classroom can actually be

realised. Diversity in the student population should ideally also be visible in the various bodies, such as programme management and the Board of Examiners. This will help to avoid cultural bias in developing course content, examples and assessment procedures.

In the field of computer science, gender diversity is also a point of attention. The faculty is doing well in this respect in programmes that traditionally attract few women, which might be related to the education model that is used. The panel is therefore confident that the programme will attract a relatively substantial number of women, although the panel also believes that the programme should be more ambitious than the 20-25% they currently focus on.

Study guidance and programme specific facilities
Students can enrol in the programme with a VWO diploma or equivalent (with the requirement to have a Dutch VWO mathematics B or equivalent). Prospective students with a mathematics deficiency will be offered an entrance test. Candidates with a non-Dutch diploma should additionally show that they have a sufficient command of the English language. A voluntary Matching and Binding procedure will be in place, aiming to assess whether the prospective student and programme are a good match.

Student counselling is organised at various levels. A mentoring programme for all first-year students by trained staff members will help in the students' transition from secondary education. Furthermore, students can contact the study advisor for academic challenges, an individual study plan, overall progress and options regarding electives and thesis. The study adviser can refer students to the necessary care in case of personal problems. At the end of the first years, students are given a Binding Study Advice (BSA). Furthermore, the programme offers various choices and electives, guidance is possible at the student's initiative. According to the panel, the way in which the programme plans to provide support and guide students in making choices, including information provision and the role of the mentor, has proven itself in other programmes in the faculty.

Concerning programme specific facilities, DKE has a lab in which student can work with equipment infused with software components, e.g., off-the-shelf robots, custom-made drones, several robotic setups, and other hardware. The lab collaborates with the FieldLab Robotics in Roermond that includes autonomous forklift trucks, high-end 3D scanners etc. For their bachelor final research project, students have furthermore access to the RWTH Aachen University Computer cluster.

Teaching staff
Staff members combine and integrate their knowledge as well as their research and design traditions into courses, skills training, and projects. The didactic concept of PCL and intensive number of contact hours lead to a favourable student to staff ratio. Teaching staff at UM is trained and supported to create a thriving learning environment that activates students' learning. The University Teaching Qualification (UTQ) training programme focuses on developing the required competencies. After completing the UTQ, staff participates in the UM Continuing Professional Development (CPD) programme. Furthermore, teaching staff is assisted in the development of courses, assessment and quality control by education and assessment specialist. Thesis supervisors are trained. The fraction of faculty that has completed UTQ at the DKE Department is 80%.

The team of lecturers with whom the panel spoke, made a good and motivated impression. Everyone is clearly involved in the development of the programme and was able to answer the panel's questions. An initial concern of the panel, that the current team of lecturers has too strong a data science and knowledge engineering background, was well addressed by the programme management. The content of the programme is strongly aligned with the DKE research lines algorithms & theoretical computer science. This shows that already computer science experts are working within the department. Furthermore, in addition to existing research themes, the faculty is in the process of rapid expansion in computer science, further strengthening the embedding of the programme.

Programme specific quality assurance
In the first years after the introduction of a new programme, quality assurance requires extra attention. The CS programme may bring its own challenges and then the programme management must be able to intervene quickly and adequately. Although it nearly looks like 'business as usual', there is a potential risk. It is important that the programme follows developments closely and acts if necessary. Despite the fact that the panel is of the

opinion that the programme is sufficiently aware of this, it explicitly mentions this aspect of quality assurance in the recommendations.

Conclusion
The panel concludes that the curriculum is sound, both in terms of content and structure. However, a number of components could be more explicitly visible. The panel is positive about PCL, whereby the integration of courses in the project has been well designed. The international classroom is supported by the panel. The team of lecturers - the part that already works for DKE - is competent and enthusiastic. When hiring new lecturers, the panel emphasises the importance of computer science knowledge. The panel's positive assessment of this standard is also based on the department's and faculty's extensive experience in setting up and implementing educational programmes.

6.3 Standard 3: Student assessment

The programme has an adequate system of student assessment in place.

Judgement
Meets the standard.

Findings, analysis, and considerations

Assessment policy
The assessment policy provides an overview of the assessment in the programme, as a means of developing and evaluating knowledge as well as supporting and enhancing learning. It is also used to inform students about their learning progress and provide feedback for improvements. The vision is made up of four elements. First is constructive alignment, which supports the assessment driving learning principle and focuses on how students learn. Assessments should therefore be authentic and relevant, embedded in teaching and learning activities, balanced between formative and summative assessment purposes, and focused on the ability to utilise and apply the knowledge, understanding and skills. Second, assessment of, for and as learning is realised by using a blend of formative (for learning) and summative (to show learning) assessment. Third is continuous development, including the development in subject domains as well as promoting constructive alignment. Constructive alignment is maintained by annual cycles involving the Programme Director, the course coordinators, and examiners. Board of Examiners (BoE), AC and the Educational Programme Committee also contribute to continuous development and alignment. The fourth and final element is student engagement, which is achieved by students creating their learning path and continuous involvement in their learning and assessment.

A variety of assessment methods are used, which is in line with the guiding principles of the assessment policy. At the start of a course, skills training or project, students are provided with the course manual that includes information on the content, timeframes, and method of assessment. Course examinations are individual and cover theories, concepts, tools, and approaches studied. Different assessment methods are used that fit the content, purpose, set-up and level of the course. Primary responsibility lies with the examiner, both for the quality of the assessment and the alignment of the ILOs, teaching and learning activities and assessment. The constructive alignment on skills training is aligned by the project coordinator(s), the educational development officer and appointed skills training instructors. Each project group gets assigned to examiners. Skills training, project process and deliverables are assessed on both the individual and the team level. Assessments include self-evaluation, peer evaluation, and input from academic staff members and/or company representatives.

The bachelor's thesis is considered the culmination of the programme, documenting the student's ability to employ the knowledge and competencies acquired in an integrated research-based project. The research and writing of the thesis take place under the supervision of a thesis supervisor who also acts as the first examiner. Prior to the bachelor's thesis, the student drafts a thesis plan which is checked by the prospective second examiner and by the BoE. After the thesis work, students write the thesis in the format of a scientific article, and a public presentation is scheduled. The assessment is done with the support of a rubric with half-point precision.

The programme aims for valid, reliable, and transparent assessment of students. In addition to the assessment policy, an assessment programme allows for visualising attainment of ILOs at the programme level. Course assessment plans provide input for this assessment programme and specify the achievement of the ILOs, the forms of assessment used and the application of the principle of constructive alignment. Within PCL, grading

rubrics and multiple moments of feedback from both peers and teaching staff guide students. Every examiner provides a course assessment plan that is evaluated by the Programme Director for constructive alignment purposes and by the BoE and AC from a quality assurance point of view. The Educational Programme Committee and the BoE are provided with an analysis of course evaluations, including feedback on assessment quality.

According to the panel the assessment policy is standing practice and similar to that of other programmes in the faculty. The programme is responsible for the quality and the BoE has a guaranteeing function, this is reflected in the extensive and well-functioning procedures. This gives the panel confidence that the assessment system will be transparent, valid, and reliable. The BoE has a good deal of experience, which will help embed the system of assessment of the CS programme. The extra work as a result of an additional educational programme will lead to an expansion of the AC. The panel emphasises the importance of this new member having explicit knowledge of computer science in order to be able to follow the introduction of the programme in terms of content and - if necessary - adjust it. The assessment plan and the assessment programme reflect the constructive alignment in the curriculum. It strikes the panel that – according to the assessment programme - each course covers a rather large number of ILOs. The panel wonders whether this is a realistic picture of the actual situation, and even if each ILO should actually be assessed this frequently. The choice of an assessment method primarily lies with the examiner; after all, they have the best insight into the subject matter and how it can be assessed. The panel was pleased to learn that curriculum-wide, the variation in assessment methods is also being considered, especially for courses are offered in parallel. The panel is positive about the choice for a bachelor's thesis in the form of a scientific article and with a public presentation.

The BoE is aware of (potential) differences with existing programmes. For example, the BoE focuses on making the distinction between the CS programme and DS-AI programme explicit. The panel indicates that there may also be differences regarding, for example, the need for practice-oriented examination methods for software engineering and security courses, software plagiarism, and organise the possibility of quick interventions. The programme and the examination board must be alert to this.

In conclusion, the panel expresses confidence in the assessment of the CS programme. The programme can participate in a well-functioning system of assessment at DKE in which those involved seem sufficiently aware of the differences with existing programmes.

6.4 Degree and field of study

The panel advises awarding the following degree to the new programme: Bachelor of Science
The panel supports the programme's preference for the following field of study: Natuur

Abbreviations

AC	Assessment Committee
ACM	Association for Computing Machinery
BoE	Board of Examiners
BSA	Binding Study Advice
DKE	Department of Data Science and Knowledge Engineering
DS-AI	Data Science & Artificial Intelligence
EAB	Education Advisory Board
ILO	Intended Learning Outcome
UM	Maastricht University
PBL	Problem Based Learning
PCL	Project Centred Learning
UTQ	University Teaching Qualification

The full report was written at the request of NVAO and is the outcome of the peer review of the new programme BSc Computer Science of Universiteit Maastricht

Application no: AV-1174

NVAO

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