

Research Evaluation Report, 2006–2011

Institute for Logic, Language and Computation
Universiteit van Amsterdam

Contents

1	Preamble	5
1.1	Introduction	5
1.2	Evaluation Procedure	5
2	The Institute	8
2.1	Brief Description	8
2.2	Quality	8
2.3	Productivity	12
2.4	Societal Relevance	13
2.5	Vitality and Feasibility	14
3	The Research Programmes	16
3.1	Logic and Language (LoLa)	16
3.2	Logic and Computation (LoCo)	18
3.3	Language and Computation (LaCo)	20
4	Summary Quantitative Assessment	22
5	Conclusions and Recommendations	22
	Appendix 1: Peer review committee	24
	Appendix 2: Site visit programme	31
	Appendix 3: Bibliometric analysis	33

1 Preamble

1.1 Introduction

The Institute for Logic, Language and Computation (ILLC) of the Universiteit van Amsterdam (UvA) is an interdisciplinary institute that crosses two faculties: Humanities and Science. This is the second official research assessment of the ILLC as a whole, carried out under the auspices of the Board of the University.

The Peer Review Committee, appointed by the Board, consisted of

Prof. Dr. Ewan Klein (Chair)	University of Edinburgh, UK
Prof. Dr. Joan Bagaria i Pigrau	Catalan Institution for Research and Advanced Studies / University of Barcelona, Spain
Prof. Dr. Wiebe van der Hoek	University of Liverpool, UK
Prof. Dr. Sabine Iatridou	MIT Linguistics and Philosophy, USA
Prof. Dr. Hinrich Schütze	Universität Stuttgart, Germany
Drs. Jan Heijn (Secretary)	

This report presents the findings of the committee, and represents their collective opinion. The members of the committee have confirmed their independence via an Independence Form according to the usual SEP procedure.

1.2 Evaluation Procedure

The evaluation was performed according to the Standard Evaluation Protocol (SEP) 2009–2015 for Public Research Organisations, as defined by VSNU, KNAW, and NWO. A comprehensive ILLC self-evaluation and outcome report was circulated ahead of time, as prescribed by the SEP. While not obligatory, a bibliometric analysis is often carried out in order to provide additional information to the review committee. In the present case, it was decided not to produce such an analysis and the reasons are given in Appendix 3.

Following the instructions of the SEP, the committee was required to give ratings for the *Quality*, *Productivity*, *Relevance* and *Vitality and Feasibility* of the research groups and of the Institute as a whole.

The 5-point numerical SEP scale for judging the *Quality* dimension is shown in Table 1. The descriptions of the 5-point SEP scale for *Productivity*, *Relevance* and *Vitality and Feasibility* are similar.

5 – Excellent	Work that is at the forefront internationally, and which most likely will have an important and substantial impact in the field. Institute is considered an international leader.
4 – Very good	Work that is internationally competitive and is expected to make a significant contribution; nationally speaking at the forefront in the field. Institute is considered international player, national leader.
3 – Good	Work that is competitive at the national level and will probably make a valuable contribution in the international field. Institute is considered internationally visible and a national player.
2 – Satisfactory	Work that is solid but not exciting, will add to our understanding and is in principle worthy of support. It is considered of less priority than work in the above categories. Institute is nationally visible.
1 – Unsatisfactory	Work that is neither solid nor exciting, flawed in the scientific and or technical approach, repetitions of other work, etc. Work not worthy of pursuing.

Table 1: SEP 5 Point Scale for Quality

The site visit lasted from Sunday November 11, 2012 to Tuesday November 13, 2012. The committee spent two full days meeting with research groups, management and with PhD and Master of Logic students. The committee also met with Prof. Dr. C. J. M. (Kareljan) Schoutens (Dean of Faculty of Science), and Prof. Dr. F. P. I. M. (Frank) van Vree (Dean of Faculty of Humanities).

The committee was impressed by the high quality, excellent organisation and thoroughness of the self-evaluation report, which was supplemented with a web-based presentation of publications of members of the ILLC. There are a couple of small changes that we would like to see considered for future self-evaluation reports. First, the report is now sufficiently long and complex that an index would help in navigating through the document. Second, the value of the quantitative information would be increased if the tabular data was also made available as machine-readable files (for example, in CSV format).

During the site visit, the three research programmes each presented illuminating reports on their activities. We particularly appreciated the accompanying research highlights provided by postdoctoral researchers (Honingh, Franke and Schaffner); these achieved an excellent balance between theory and practical applications, and showcased the vitality, originality and enthusiasm of the new generation of ILLC staff. The committee also held separate meetings with each of the research groups.

The ensuing discussions were lively and open, and demonstrated a distinctive esprit de corps and sense of belonging across the whole ILLC community.

At the end of the site visit, the preliminary findings (minus the quantitative assessments) of the committee were orally communicated to the members of the ILLC by the committee's chairman. For the full programme of the site visit, see Appendix 2.

2 The Institute

2.1 Brief Description

Building on a distinguished history of Dutch research in the field of mathematical logic, the Institute for Logic, Language, and Computation (ILLC) is an interdisciplinary, cross-faculty centre that has developed a unique and innovative programme of research over the last 35 years. It engages in a broad spectrum of themes, ranging from mathematical logic and applied logic through philosophy of language and formal semantics to natural language processing and cognitive science. During the early phases of ILLC's development, logic was taken as the integrating principle, but in recent years, the mission has broadened to encompass *formal approaches to information and interaction*, signalled by an increasing interest in areas such as game theory and probabilistic models. Although drawing on many established disciplines, the ILLC is also contributing to the foundations of a novel discipline of information, the scope of which will only become clearer in future years.

Quantitative Assessment

Overall institute evaluation	5
Quality	5
Productivity	5
Relevance	5
Vitality & Feasibility	4
Leadership	5

2.2 Quality

The ILLC has a well-deserved international reputation for outstanding research across the range of its activities, and many of its members are regarded as leaders in their fields. We comment in more detail on academic reputation in our reviews of the three research programmes; see Section 3.

Training Activities

Master of Logic The ILLC offers a highly innovative two-year Master of Logic (MoL) programme which attracts students from all over the world, and which was ranked by the NVAO in 2007 as one of the top Masters programmes in the whole of the Netherlands. The MoL programme has all the features of what are termed “research masters” in the Netherlands; the committee was impressed to learn that

30%–40% of Masters theses give rise to a publication, and that approximately 70% of graduates of MoL are successful in subsequently obtaining a PhD position.

Logic clearly runs through all the courses offered by the MoL and it is noteworthy that students without sufficient prior grounding are required to take the *Basic Logic* course at the start of the programme. Nevertheless, we had a concern that the title of the degree might be taken to imply that graduates have attained a higher level of experience in mathematical logic than is often the case.

PhD The ILLC has a long history of graduating excellent PhD students, and during the period of assessment it has been notably successful in obtaining funding for PhD positions, particularly through a large Marie Curie project and through two Vici research grants from the NWO. PhD training is provided through a number of routes, including access to advanced level Master of Logic courses; participation in a rich variety of seminar series and colloquia at both the ILLC and affiliated organisations such as CWI; and participation in short intensive courses offered by national research schools and the annual European Summer School in Logic, Language and Information. In order to explore connections between their research and the world outside academia, ILLC PhD students organise an annual event (supported by the Institute) which features talks by a range of external guest speakers.

It is recognised within the Institute that although the training programme has worked well in practise, it lacks clear articulation and formal structure. Indeed, the committee would have appreciated it if a more explicit presentation of the PhD training programme could have been offered as a component of the site evaluation. In particular, we would have liked to see to what extent the training addresses the needs of students whose work pushes at the boundaries of the methodologies traditionally adopted in ILLC research. However, we also note that an internal review of PhD training is currently being carried out to address at least some of these issues.

The duration of a PhD in the Faculty of Science is normally four years, which includes approximately 20% time devoted to teaching or similar tasks. Of the 65 students who might have been expected to graduate during the evaluation period, approximately 22% completed within four years of starting, while another 48% completed within five years. As the 2000-2005 evaluation report noted, these completion rates are good by Dutch standards. Nevertheless, given that absence of funding is likely to handicap students who continue much beyond their fourth year, it would be desirable if the Institute could find ways to reduce the number of students (~20%) who continue their PhD studies into a sixth year.

Of the 46 PhD students admitted during the evaluation period, 15 (33%) were female. In comparison with similar graduate programmes, this is a reasonably high proportion.

The committee members met informally with a selection of students from both the MoL and the PhD programme, and were uniformly impressed by their enthusiasm

and high level of satisfaction with the Institute. It was also noted that the ILLC invests significant resources in providing office space (and administrative support) for both MoL and PhD students within the overall accommodation assigned to the Institute at Science Park.

Resources and Facilities

The ILLC has been extremely successful in attracting and retaining a very strong body of researchers, many of whom are world leading in their area. The number of FTE tenured research staff in the ILLC has increased slightly over the period of assessment, from 9.11 to 11.32. The proportion of these posts funded by the Faculty of Humanities has edged down from 46% in 2006 to 42% in 2011.

Despite the relatively low base of permanent staff, the ILLC has been able to attract a new generation of highly promising young researchers to join the Institute, most notably through Veni scholarships under the Dutch Innovative Research Incentives Scheme (*Vernieuwingsimpuls*).

It was noted by the ILLC management that the small number of full time appointments can make it difficult to find the human resources required for carrying out essential administrative tasks. Their response to this involves on the one hand, finding extra resources for teaching through assigning teaching duties to postdocs and through hiring temporary staff with a higher teaching load; and on the other hand, providing relief from teaching for staff with a higher administrative load. While this policy may bring some problems of its own, it seems to be a reasonable tactic for addressing increasing demands with limited resources.

There are some issues concerning the staff complement which we would like to draw attention to.

The previous Peer Evaluation Report noted with approval that the Chair in Mathematical Logic, recently vacated by Professor de Jongh, would be filled by Professor Väänänen. However, the current situation is that Väänänen only holds a 0.1 appointment. The main other contributor to the area of classical mathematical logic (which comprises set theory, model theory, computability theory and proof theory), namely Professor Löwe, only holds a 0.5 appointment. While the contributions of these two staff members should not be underestimated, there is still an urgent need to make a strong appointment in classical mathematical logic. It should be noted that during the assessment period, Yde Venema became full Professor, and Alessandra Palmigiano took up a permanent position at ILLC. They both contribute to the area of algebraic logic, which is also a branch of mathematical logic.

The Chair in Computational Linguistics, formerly held by Professor Scha, was abolished by the Faculty of Humanities due to budgetary constraints. Consequently there is at present no-one with responsibility for teaching computational linguistics

within the Department of Language and Literature. Since computational linguistics is becoming increasingly central to the Humanities curriculum, and since the employment prospects for well-trained computational linguists are very good, we believe that an investment in this area could lead to rich dividends in terms of future student enrolment. In addition, it would help to further underpin the coherence and viability of the LaCo group within the Institute, and this in turn would support collaboration on computational approaches to semantics between LaCo and LoLa.

Also within LaCo, the positions of Bod and Honing were both originally fixed-term five year appointments made by the Faculty of Humanities. We welcome the fact that Bod's post has since been made permanent, but there is an obvious concern that Honing's chair is still temporary. Looking to the future, we felt that while the intention behind opening up these posts was welcome, such positions were unlikely to attract external candidates of the highest calibre unless there was a guarantee of continuation beyond the initial five year term.

Within the LoCo group, the retirement of Van Emde Boas has left a vacant position in theoretical computer science. Filling this post would be beneficial for the group, and would increase opportunities for collaborating with CWI or the UvA's Informatics Institute. Moreover, many strands of research within the Institute rely on computational techniques and need to be informed about foundational issues involving the decidability and complexity of computational problems.

There has been a welcome increase in the appointment of female research staff since the last review, albeit starting from a very low baseline. We strongly encourage the Institute to continue with this strategy, and we look forward to seeing women represented at the full professor level.

Organisation and Leadership

As in the preceding evaluation period, the Institute's work is divided across three programmes: Logic and Language (LoLa); Logic and Computation (LoCo); and Language and Computation (LaCo). This partitioning seems to work well from an organisational point of view, and provides an appropriate level of coherence and focus, while not impeding communication and collaboration across the different programmes. Members of all three programmes emphasised how, in numerous respects, their research had benefitted from the opportunities afforded by the ILLC of interacting with and learning from colleagues in neighbouring disciplines.

Each programme has both a leader and deputy leader, and the committee's impression was that this arrangement afforded enough strong leadership to guarantee effective strategic planning, while remaining flexible enough to respond rapidly to new circumstances. Moreover, the Institute as a whole operates with a relatively flat management structure, allowing associate and assistant professors significant autonomy and freedom to take their own initiatives. Coupled with due respect for

the principle of consensus-based decision making, the organisation seems to have achieved a highly productive management style. The recent innovation of holding biweekly meetings of the Management Team (consisting of the Institute’s Director and Manager and the three research programme leaders) has also contributed to striking a good balance between democracy and executive efficiency.

Not surprisingly, concern has been felt in recent years that the impending, closely bunched, retirement of core members of the ILLC (e.g., Van Benthem, Groenendijk, Stokhof and Veltman) would undermine the continued viability of the Institute. However, the committee was reassured by the intellectual quality and personal drive of the new generation of younger researchers, some of whom such as Endriss, Dekker, Bod and Sima’an are already occupying leadership positions at the programme level. In addition, Venema is proving to be an astute and energetic Institute leader, and seems to inspire a high degree of trust and support across all constituencies. Overall, the transfer of responsibility to this new generation is well underway, and the outlook for the future is highly promising.

2.3 Productivity

The overall level of productivity is excellent. As we remark in Section 3, all three research groups have produced a high level of publications relative to norms in their respective subareas. Table 2 provides a quantitative view of the productivity of the three research groups per FTE (including PhD students) over the review period. Only refereed journal papers and conference papers have been included in the counts, since these are the research outputs that tend to be most important in gauging impact.

	LoLa	LoCo	LaCo
Publications	9	17	21
External research income (k€)	305	181	524

Table 2: Publications and Research Income per FTE, 2006-2011

Table 3 gives a breakdown of the three major categories of publication for each ILLC group; the percentages are taken with respect to all publications by the group. Despite the variations across the groups, these results are impressive overall; the differences reflect wider cultural norms in the various disciplines represented by each group.

In the preceding period of assessment (2000-2005), the ratio of direct (i.e., UvA) funding to external research and contract funding was around 1:1. During the current period, the average has shifted closer to 1:2. This partly reflects a trend in Dutch national policy where income has been transferred from universities to research

	LoLa		LoCo		LaCo	
Refereed journal articles	70	26%	199	31%	64	17%
Book chapters	60	22%	87	13%	24	6%
Conference papers	84	31%	229	35%	235	62%
All publications	267		646		382	

Table 3: Publications by Major Category, 2006–2011

funding bodies. The increasing reliance on external income places additional pressure on the ILLC to maintain a stream of grant funding; nevertheless, within a highly competitive field, the ILLC appears well able to hold its own.

The Institute promotes productivity by holding annual review meetings between staff members and their line managers, and research output (both qualitative and quantitative) is a key agenda item at these talks. In addition, the ILLC’s internal promotion policy takes research output into account, together with performance in teaching, administration and success in obtaining research funding.

Like many other major funding bodies across the world, the NWO is increasingly supporting an open access policy for publications. While the ILLC itself currently does not have a policy on open access publication, this is likely to be addressed in the coming years.

2.4 Societal Relevance

As noted in the self-review, key areas in which the ILLC makes research contributions, such as philosophy of language, mathematical logic and theoretical computer science have had profound effects on the cultural and technological developments over the last 50 years, and underpin the current ‘digital age’. However, it is unrealistic to expect current fundamental research into these topics to have short-term, measurable impact.

Efforts by members of the Institute to reach the general public are impressive, and include public lectures, media interviews, and well-received popularising books on the history of the humanities and on music cognition.

Although graduates from the ILLC’s MSc and PhD programmes are well represented in academic posts, a significant number choose careers in management and information technology. The Institute is working to improve its support for graduates who seek non-academic employment, to complement other initiatives within the UvA for nurturing the employability of graduates, such as skills courses organised by the Graduate School of Humanities.

Within the ILLC, the research group with the most direct valorisation potential is LaCo, and members of that group have been strikingly successful in helping to realise that potential; cf. Section 3.3.

2.5 Vitality and Feasibility

It was clear from our site visit that the ILLC receives strong support from both the Faculty of Humanities and the Faculty of Science. One striking indication of the collaborative spirit of the two Faculties is the decision to hold a common selection committee for two strategic, chair-level appointments in philosophy of language and philosophical logic.

Although the management of a cross-faculty unit inevitably has to deal with institutional ‘friction’ (e.g., different norms in the two faculties for allocating staff effort), all parties in the relationship showed remarkable willingness to maintain the ILLC’s position in the University despite such obstacles. The value of the cross-disciplinary perspective which this arrangement underpins is evident in the intellectual openness and sense of excitement shown by members across the three research programmes. The cross-faculty nature of the ILLC is also welcome as a far-sighted contribution to wider efforts to reduce the cultural barriers between science and the humanities.

The physical relocation of the bulk of the Institute to the Science Park appears to have taken place smoothly. Although it is unfortunate that three members of staff have chosen not to participate in this relocation, their decisions are well-grounded on a case-by-case basis, and there is no evidence that the coherence or management of the ILLC is significantly impaired by it. We gather that the ILLC will shortly move again to another building nearby, in order to accommodate their growth in numbers. While this is bound to be somewhat disruptive, there do not appear to be grounds for any wider concern.

In general, the division of the Institute into three programmes appears to be working well; the division makes management easier, and focusses research efforts without unduly hampering dialogue across the programme boundaries. (We were somewhat surprised, however, by the apparent lack of interaction on the topic of quantum computing between the LoCo and LoLa programmes.)

In terms of comparator institutions, neither LoCo nor LaCo would be regarded as particularly large, especially when measured in terms of tenured FTES. LoLa is an exception, since there are hardly any other groups which have such a relatively large number of researchers working intensively on the formal semantics and pragmatics of natural language. The existence of this long-standing endeavour is due in part to the enlightened funding policies of the NWO (and before that, the ZWO); there are few countries where research grants for either philosophy or linguistics would have provided an equivalent level of support for a single group over such a relatively long period. It seems unwise to rely on this favourable national funding climate to continue indefinitely, and there are already signs that a greater emphasis on applied research is coming to dominate Dutch national funding priorities. This is likely to impact on more foundational research in all three research programmes.

Although there will undoubtedly be challenges ahead, the current Institute strategy seems sound: on the one hand, to focus more on international funding bodies such as the European Research Council, and on the other hand, to enter into strategic alliances with groups in other Dutch universities so as to build research consortia with a wide range of competences.

From a structural point of view, recent developments in the LaCo group may be worth reflecting on further. The scientific scope of the programme has been significantly broadened by the success of research in music cognition and there has also been a rapid expansion into the burgeoning area of digital humanities, evidenced both by Kamps' work and by Bod taking a leading role in the new Center for Digital Humanities, founded with seed money from the Faculty of Humanities. These are exciting new initiatives, but may need careful strategic planning to ensure that overall coherence is not adversely affected.

A challenge is posed by the imminent merger of the science faculties of the Universiteit van Amsterdam and the Vrije Universiteit Amsterdam. Discussions about both the structure of the new Amsterdam Faculty of Science (AFS) and about the ILLC's location within that structure were underway during our site visit; given this fast-moving situation, it was difficult for us to come up with a clear view of the best way forward. One thing that stood out, however, was the unanimous agreement of ILLC members that splitting parts of the Institute across different schools or divisions in the AFS should be avoided.

3 The Research Programmes

3.1 Logic and Language (LoLa)

Introduction

The Logic and Language group, headed by Jeroen Groenendijk and Paul Dekker, studies philosophy, logic, language and the many connections between the three. Although the group's work is rooted in philosophy, it has substantial components of linguistics (especially in semantics and pragmatics) and, to a lesser extent, cognitive science. Since the last period of evaluation, four younger researchers have been appointed to tenured posts.

Quantitative Assessment

Quality	5
Productivity	5
Relevance	4
Vitality & Feasibility	5
Leadership	5

Quality

LoLa's current leadership has been highly effective in providing strategic direction to the research programme.

The academic reputation of the group is outstanding. It contains staff who have international recognition and influence and attracts visitors and students of the highest quality from around the world. Members of LoLa have been awarded a number of competitive grants from different organisations, including the very prestigious European Research Council (ERC). They are also present on the editorial boards of almost all major journals in the relevant fields.

The span of research themes covered by the group is relatively wide, and one challenge for the future will be to ensure that diversity is balanced by overall coherence.

Productivity

LoLa has an excellent publication record, and several of their journal articles are world-leading. The number of papers in refereed journals rose in 2011 after a temporary dip during the preceding two years. The total number of publications in 2011 is slightly lower than in previous years and this seems to be due to a decrease in conference papers. A relatively high proportion of output (22%) appears in book chapters, and arguably it would be better to shift the balance of these towards the category of refereed journals.

During the period of assessment, members of the group have received five Veni grants, two Vidi grants, and a very substantial ERC grant.

Societal Relevance

Over the course of many years the group has built up an international influence in the philosophy of language, philosophical logic, semantics and pragmatics. This is shown, for example, by their involvement on the editorial boards of leading journals and in their success in organising international conferences, most notably the biannual Amsterdam Colloquium, which is renowned as a forum for pioneering work in semantics and pragmatics.

Senior figures in the group are members of high-level research committees in several countries, and outreach activities include lectures for primary and secondary school audiences as well as work crossing the boundary between philosophy and art. The group's research into game theoretic models of communication have also given rise to contacts with groups in economics.

Vitality, Feasibility and Vision

LoLa is the last group which still contains a strong representation from ILLC founders — senior researchers who are responsible for much of the ILLC 'brand' — and is facing a significant transition as their places are taken by the next generation. It is expected that leadership will change as the result of two imminent chair appointments, in philosophy of language and philosophical logic. The committee applauds the fact that these two posts, despite being held in different faculties, are being decided by a single, joint appointments committee.

Over the last two decades, the work of researchers in LoLa has substantially reshaped the landscape of natural language semantics and pragmatics. While there is still valuable work being carried out in LoLa to consolidate and deepen this programme, new avenues and methodologies are being explored, for example in the application of 'signalling games' to theories of meaning (van Rooij), in computational models of dialogue (Fernández), and in corpus-based studies of multi-dimensional predicates (Weidman Sassoon). These initiatives promise to strengthen collaborative links with LaCo and other research groups within the University.

Another direction that would repay further attention is the syntax-semantics interface; in general, natural language semantics cannot be dissociated from the study of syntax. Since LoLa currently does not have anyone working in this area, it is unfortunate that the main syntax-semantics researcher in the Amsterdam Center for Language and Communication, Hedde Zeijlstra, will be leaving UvA in April for a chair in Germany. It would be highly desirable to find a replacement with comparable expertise in this area.

3.2 Logic and Computation (LoCo)

Introduction

The Logic and Computation group, headed by Ulle Endriss and Benedikt Löwe, studies areas ranging from foundational issues in mathematics and theoretical computer science through quantum computing and co-algebra to artificial intelligence and knowledge representation. During the period of assessment, the group has seen several changes in terms of staffing: Professors Van Emde Boas and Vitányi retired, the appointment of Professor Väänänen was reduced to 0.1 FTE, and Professor Venema became head of ILLC. On the other hand, Palmigiano was appointed as assistant professor, and toward the end of the period, the group was joined by two CWI researchers, Van Eijck and De Wolf (professors at 0.2 FTE), by Baltag (associate professor), and by Adriaans (professor at 0.2 FTE).

Quantitative Assessment

Quality	5
Productivity	5
Relevance	5
Vitality & Feasibility	5
Leadership	5

Quality

Leadership is strong, and the representation and involvement in the Institute board works well. The group hosts some staff that are world-leading in their respective fields. In particular, they host members of the *Academia Europaea*, and the KNAW, and a member was knighted. Several staff and students won prizes for their scientific achievements, and there is a very healthy visibility in scientific boards of journals and conferences. Some members of the group also hold leading positions in European research networks.

The group has a relatively large number of staff with an appointment of 0.2 FTE or lower. This has some consequences in terms of administrative workload, but this cost seems to be outweighed by the benefits: those part-time staff bring in esteem, contribute teaching effort, and often graduate PhD students.

The hiring of Professor Väänänen, a leading figure in logic, was a very positive step in boosting the visibility of the group in classical areas of mathematical logic such as model theory and set theory. Although his appointment has been reduced to 0.1 FTE, his involvement in the group and the Institute still has a positive effect. Maintaining the group's strength in mathematical logic is a strategic goal that the Institute is pursuing by the recent announcement of a new open position in the area.

Productivity

The group should be applauded for their productivity: both the quality and quantity of its scientific output is excellent, and in many cases, world-leading.

Over the last three-year period there is a clear increasing trend in the number of refereed articles published in leading journals. We think this is the right publication strategy.

Resources and facilities are adequate, and all staff involved now have an office in the same building. Although the research of the group is often theoretical in nature, the group has generated a healthy research income of almost 5M € over the assessed period. On top of this, the group hosts a number of staff with prestigious grants: two Vici grants, two Vidi grants, four Veni grants, a Marie Curie Research Training Site, and initiation and involvement in the ESF LogiCCC programme.

The current policy of applying systematically to European funding agencies, such as the ERC, is heading in the right direction.

The group has also an excellent ratio of PhD theses to the number of FTE members. The group produced seven PhD theses per year on average over the last four years.

Societal Relevance

Apart from the service to the community in terms of membership in editorial boards and the organisation of international conferences mentioned above, members of the group have engaged in outreach activities and have contributed to knowledge exchange and the dissemination of their work to wider audiences. Among such activities let us mention lectures targeted at school children, the training of academics in China, the edition of several textbooks, and the collaboration between computer science students, commercial partners, and ILLC members.

The group is also involved in interdisciplinary research outside the confines of ILLC, in particular with colleagues in physics, economics and social science.

Vitality, Feasibility and Vision

At the time of the evaluation, LoCo was intending to recruit in the area of mathematical logic; the committee thinks this is indeed a priority area for investment.

The group should also consider how to fill the position in theoretical computer science left vacant following the retirement of Van Emde Boas. The committee feels that the current spread of topics covered by the group is sufficient and that new resources might best be spent on deepening existing strengths, rather than on further widening them.

3.3 Language and Computation (LaCo)

Introduction

The Language and Computation group, led by Rens Bod and Khalil Sima'an, is concerned with natural language processing and cognition, music cognition, information retrieval and digital humanities.

Quantitative Assessment

Quality	5
Productivity	5
Relevance	5
Vitality and Feasibility	4
Leadership	5

Quality

Leadership of the group is excellent. Bod, Sima'an and Honing have a high international standing as researchers, and the other members of the group are similarly highly regarded internationally, in proportion to seniority.

The strategy of engaging with practical tasks in the digital humanities, machine translation and information retrieval has paid off in terms of funding and recognition. The group's engagement in statistical approaches to computational linguistics marked a departure from ILLC's traditional research orientation. It is to be hoped that the high quality work that LaCo is pursuing in this area will influence the other ILLC groups as well and open up possibilities for new interdisciplinary research that involves several areas. There are some initial signs that this may be happening.

Of the three groups within ILLC, LaCo's research places the highest demands on computational resources, due to the large scale of the textual datasets being analysed. The ILLC management needs to ensure that funding for this vital infrastructure is placed on a sustainable basis.

Productivity

There are many first-class papers in the top-rated conferences of the field (ACL, EMNLP, SIGIR, CIKM). As in other areas of computer science, publication in internationally-leading NLP conferences is highly competitive, and is regarded as equaling or sometimes exceeding the impact of journal publications. In information retrieval, there is also engagement with the competitions and bake-offs that drive this field, including INEX, CLEF and TREC. The leader of the group, Rens Bod, has become somewhat less visible in the core areas of computational linguistics and natural language processing, due to the fact that he has largely shifted his focus to computational cognition and digital humanities. However, his recent book on the history of the humanities promises to be of high impact once it has been translated from Dutch into several other languages.

Societal Relevance

The work on digital humanities, machine translation, information retrieval, and music cognition, among other topics covered, is at the leading edge of international research.

The work of this group is perhaps the most directly related to commercially and socially significant applications in natural language processing, information processing, and music processing. As such, it is of very considerable social relevance, above and beyond the less tangible but nonetheless real social importance of basic research and scientific training common to all of ILLC.

Vitality, Feasibility and Vision

As mentioned earlier, Professor Scha's post in the Faculty of Humanities has been abolished. Despite the obvious strengths of the next generation of researchers represented in language and computation, the fact that there is no full professor of computational linguistics is a threat to the long-term future of excellent language and computation research.

One reason this is of concern is that the Scha position had an important role in integrating the language and computation area as well as ILLC as a whole. On the area level, the diversity of research activities has increased significantly since the last review. There are at least five distinct areas in which the group will be active over the next five years: digital humanities, machine translation, music, information retrieval and statistical semantics. An established Chair in Computational Linguistics would help ensure that the group remains a unified synergetic research unit despite this diversity.

Our misgivings about the elimination of the computational linguistics position notwithstanding, the language and computation team as a whole consists of a very strong group of researchers. It will be further strengthened by the hiring of Ivan Titov, a rising star in statistical natural language processing and computational semantics.

4 Summary Quantitative Assessment

	LoLa	LoCo	LaCo	ILLC
Quality	5	5	5	5
Productivity	5	5	5	5
Relevance	4	5	5	5
Vitality & Feasibility	5	5	4	4
Leadership	5	5	5	5

5 Conclusions and Recommendations

The ILLC has a well-deserved reputation as an internationally leading centre for interdisciplinary research and training. Research quality and productivity are both excellent, and the Institute also maintains vigorous Masters and PhD programmes which attract high calibre students from around the world.

The cross-faculty status of the ILLC, underpinned by the Board of the University of Amsterdam, is arguably a key ingredient in its success, and both Faculties are to be congratulated on providing solid, long-term support for the ILLC.

The interdisciplinary mix of research topics pursued by the ILLC makes it unique, and this variety is successfully tied together within the mission of studying formal approaches to information and interaction. Indeed, the ILLC belongs to a small number of pioneering groups that seek to lay the foundations for what may well become a new discipline of information in coming decades.

We are impressed by the way that the transition to a new generation of ILLC leaders is being managed, and have confidence that the originality and excellence manifested in the institute's distinguished research record will flourish under their care.

Recommendations

Integrity and Cohesion

1. The main priority with respect to the establishment of the new Amsterdam Faculty of Science is that the organisational integrity of the ILLC should be vigorously protected.
2. In the previous Peer Review Report, it was noted that

The new research programmes to some extent represent a step in the direction of a return to a traditional division between Science and Humanities. The Institute should be on guard in the coming period against further fragmentation and isolation....

Although we felt that division into LoLa, LoCo and LaCo was serving the Institute well, we would like the ILLC management to keep this programme structure under review, and to consider whether further mechanisms could be put in place to encourage cross-programme collaboration.

Staffing

It goes without saying that the tenured staff are a crucial factor in ensuring the long-term viability of the ILLC. The committee recognises that both Faculties have invested in ILLC posts at all levels and that new appointments are already in the pipeline. Nevertheless, we feel that the following positions need to be carefully considered.

3. The previous Peer Review Committee drew attention to the continued absence of a Chair of Computational Linguistics, and we have already pointed out that we would like to see this post renewed. The ILLC management should also make it clear that they regard this position as a priority.
4. The committee understands that steps are already underway to make a new appointment in mathematical logic. Given the centrality of logic to the ILLC, we believe that it is essential to appoint either a senior established figure or a “rising star” to this position.
5. We understand that the ILLC is aware of the need to have representation of theoretical computer science at a senior level, and that they are exploring possibilities with groups elsewhere on how best to proceed. We encourage them to do so, and stress that this is an important area to keep in good health.
6. We would like the Faculty of Humanities to find some means for giving Honing’s chair a permanent status.

Appendix 1: Peer review committee

The Peer Review Committee consisted of:

- Prof. Dr. Joan Bagaria i Pigrau
Mathematical Logic
Catalan Institution for Research and Advanced Studies /
University of Barcelona
Barcelona, Catalonia (Spain)
- Prof. Dr. Wiebe van der Hoek
Logic & Computation
Dept. of Computer Science
University of Liverpool
Liverpool, United Kingdom
- Prof. Dr. Sabine Iatridou
Linguistics and Philosophy
Massachusetts Institute of Technology
Cambridge, USA
- Prof. Dr. Ewan Klein (Chair)
Semantics / Cognitive Science
University of Edinburgh
Edinburgh, United Kingdom
- Prof. Dr. Hinrich Schütze
Computational Linguistics
Institut für Maschinelle Sprachverarbeitung (IMS)
Universität Stuttgart
Stuttgart, Germany
- As secretary acted Drs. Jan Heijn, self-employed physicist and former executive secretary of several state and international evaluation committees.

Curricula Vitæ

Joan Bagaria i Pigrau

Research Professor at ICREA (Institució Catalana de Recerca i Estudis Avançats)
Associate Researcher, Universitat de Barcelona, Department of Logic, and History
and Philosophy of Science

Academic education and degrees

- 1984 MA in Philosophy, Universitat de Barcelona
- 1991 PhD in Logic and the Methodology of Science, University of California, Berkeley

Research interests

Set theory, mathematical logic, foundations and philosophy of mathematics, applications of set theory to other areas of mathematics

Previous academic positions

- 1991–1992 Post-doctoral researcher, University of California, Berkeley
- 1992–1995 Professor Titular, Department of Mathematics, Universitat Autònoma de Barcelona
- 1995–1996 Visiting Professor, Universitat Pompeu Fabra, Barcelona
- 1996–2001 Professor Titular, Department of Logic and History and Philosophy of Science, Universitat de Barcelona

Professional activities

Director of the Barcelona Research Group on Set Theory (BCNSETS)
ICREA Director's scientific advisor
Chairman of the ESF Research Networking Programme 'New Frontiers of Infinity: Mathematical, Philosophical, and Computational Prospects', 2009–2014

Member of the Standing Committee of the:

Consell Català de la Comunicació Científica (C4), since 2004

Member of the Scientific Advisory Board of the Centre de Recerca Matemàtica (CRM), 2004–2007

Chairman of the Program Committee, Logic Colloquium 2009, Sofia

Chairman of the Organizing Committee, Logic Colloquium 2011, Barcelona

Member of the Programme Committee, European Congress of Mathematics (ECM) 2012, Krakow

President of the European Set Theory Society, 2007–2011

Member of the Editorial Board of the European Encyclopedia of Mathematics

Wiebe van der Hoek

Professor of Computer Science, University of Liverpool, UK

Academic education and degrees

1977–1982 Institute for Professional Studies ‘Ubbo Emmius’, Groningen
Received two qualifications for teaching at secondary school:
one for Mathematics and one for Dutch Language

1982–1986 Mathematics, University of Groningen

1988–1992 PhD in Computer Science and Mathematics, Vrije Universiteit,
Amsterdam

Academic positions

1992 (spring) Research Assistant (‘Post-doc’) Radboud University, Nijmegen, the Netherlands

1992–1993 Research Assistant (‘Post-doc’) Vrije Universiteit, Amsterdam, the Netherlands

1993–2001 Lecturer, Department of Computer Science, Utrecht University, the Netherlands

2000–2001 Part-time Associate Professor, Department of Philosophy, Utrecht University, the Netherlands

2001–2002 Associate Professor, Department of Computer Science, Utrecht University, the Netherlands

2002–present Professor at the Department of Computer Science, University of Liverpool, United Kingdom

Research interest

Modal logic, epistemic logic, formal approaches to rational agency, multi-agent systems, logic and game theory

Professional activities

Editor-in-Chief of *Synthese*, since January 2012

Founder and Editor-in-Chief of *Knowledge, Rationality and Action*, 2004–2012

General Chair of Autonomous Agents and Multi-Agent Systems (AAMAS), Valencia, 2012

Program Chair of Autonomous Agents and Multi-Agent Systems (AAMAS), Toronto, 2010

Conference Chair of the European Conference on Logics in AI (JELIA), Liverpool, 2006

Editorial Board of the journal *Autonomous Agents and Multi-agent Systems*, since 2004

Associate Editor of *Studia Logica*, since 1998

Board of the conference *Logic and the Foundations of Game and Decision Theory (LOFT)* since 1998

Chair Advisory Board of the European Workshop on Multi-Agent Systems (EU-MAS), 2006–2008

Coordinator of the AgentLink work package Education and Training, thereby responsible for the annual European Agent Systems Summer School, 2001–2005

Board member of the Belgium-Dutch Association for Artificial Intelligence, 1998–2002

Awards

William Evans Award, enabling to be a William Evans Visiting Fellow of the University of Otago, 2002

Fellow of the British Computer Society, since 2003

Best paper Autonomous Systems and Multi-Agent Systems (AAMAS), 2008

Best paper Autonomous Systems and Multi-Agent Systems (AAMAS), 2009

Sabine Iatridou

Professor of Linguistics, MIT, Cambridge, USA

Academic education and degrees

1991 PhD in Linguistics, MIT, Cambridge, USA

Academic positions

- 1991–1997 Assistant Professor, University of Pennsylvania
- 1997–2001 Associate Professor, Massachusetts Institute of Technology
- 2001–present Full Professor, Massachusetts Institute of Technology

Research interests

Syntactic theory, syntax-semantics interface, formal semantics, modality, tense, cross-linguistic semantic variation

Professional activities

- 1994–1999 National Young Investigator Award, National Science Foundation
- 1994 Professor, GLOW Summer Institute, University of Girona, Spain
- 1997 Professor, LSA Summer Institute, Cornell University
- 2002 Professor (visiting), Autonomous University of Barcelona, Spain
- 2005 Director, 2005 LSA Summer Institute, hosted by MIT and Harvard University
- 2007–present Director of the Graduate Program in Linguistics, Department of Linguistics and Philosophy, MIT
- 2009 Professor, LSA Summer Institute, Berkeley

Ewan Klein

Professor of Language Technology, School of Informatics, University of Edinburgh, UK

Academic education

- 1972 BA in Social and Political Sciences, University of Cambridge, St Johns College
- 1973 MA in General Linguistics, University of Reading, Department of Linguistic Science
- 1974 PhD in Formal Semantics, University of Cambridge (affiliated student, Department of Philosophy, Bedford College, London)

Academic positions

1978–1980	Research Fellow, Cognitive Studies Programme, University of Sussex
1980–1983	Lecturer in Linguistics, Dept of English Language, University of Newcastle upon Tyne
1983–1985	SERC Advanced Research Fellow, School of Epistemics, University of Edinburgh
1985–1987	Lecturer, Centre for Cognitive Science, University of Edinburgh
1987–2004	Reader, School of Informatics, University of Edinburgh
2004–present	Professor of Language Technology, School of Informatics, University of Edinburgh

Research interests

Computational semantics, formal semantics of natural language, information extraction, semantic web, analyzing social media

Professional Activities

1987–1991	Head of Department, Centre for Cognitive Science, University of Edinburgh
1991–1994	Coordinator of ELSNET, EU Network of Excellence in Language and Speech
1995–present	Member of Editorial board of Studies in Language and Philosophy
1996–2000	Head of Department, Centre for Cognitive Science, University of Edinburgh
1999–present	Member of Steering Committee of ICOS (Inference in Computational Semantics)
2001	Director of Natural Language Research Group, Edify Corporation
2004	Research Leader, e-Science Institute, University of Edinburgh
2005–2010	Fellow of the British Computing Society
2010–present	Member of ESRC College of Peers
2012–2013	Seconded researcher, Institute for Academic Development, University of Edinburgh

Hinrich Schütze

Professor of computational linguistics at the University of Stuttgart, Germany

Academic education and degrees

- 1989 Diplom Informatik, University of Stuttgart
- 1995 PhD Computational Linguistics, Stanford University

Academic positions

- 1995–2000 Researcher at Xerox PARC
- 2000–2004 Consulting Assistant Professor, Stanford University
- 2004–2012 Professor of computational linguistics, University of Stuttgart
- 2008–2009 Visiting Faculty, Google, Mountain View, California
- 2012 Visiting Professor, CS Department, Stanford University

Research interests

Natural language processing, computational linguistics, information retrieval, machine learning

Professional activities

- 1996–1998 Editorial Board Member of Computational Linguistics
- 2000 Co-Chair of Empirical Methods in NLP / Very Large Corpora
- 2000–2012 Board Member of ACL SIGDAT Advisory/Organizing Committee
- 2008–2010 Board Member of Fachgruppe IR of Gesellschaft für Informatik
- 2009–2010 Executive Director, Institute for NLP, University of Stuttgart
- 2013 Chair, Annual Meeting, Association for Computational Linguistics

Appendix 2: Site visit programme

Sunday, November 11

Arrival of the committee members
Pre-meeting discussion and working dinner

Monday, November 12

9:00–9:30 Arrival, administrative matters
9:30–11:00 Introduction & meeting with Management ILLC
Participants: Batson, Bod, Endriss, Groenendijk, Venema
11:00–12:30 Language and Computation (LaCo)
Introduction: Rens Bod
Highlight: Aline Honingh
Participants: plenary (mandatory for LaCo group)
Discussion in the Committee's Room
Participants: Bod, Honing, Sima'an, Kamps, Zuidema
12:30–13:00 Closed evaluation session
13:00–14:30 Lunch with a selection of PhD and MoL students and a brief participation by Johan van Benthem
14:30–16:00 Logic and Language (LoLa)
Introduction: Jeroen Groenendijk
Highlight: Michael Franke
Participants: plenary (mandatory for LoLa group)
Discussion in the Committee's Room
Participants: Groenendijk, Stokhof, Veltman, Dekker, Smets, Van Rooij
16:00–16:30 Closed evaluation session
16:30–17:30 Informal tour of ILLC, talks with staff, drinks

Tuesday, November 13

9:30–11:00 Logic and Computation (LoCo)
Introduction: Ulle Endriss
Highlight: Christian Schaffner
Participants: plenary (mandatory for LoCo group)
Discussion in the Committee's Room
Participants: Endriss, Loewe, Venema, Torenvliet, Baltag, Buhrman

11:00–11:30	Closed evaluation session
11:30–12:00	Transport to city centre
12:00–14:00	Lunch Participants: Deans (Schoutens / Science, Van Vree / Humanities)
13:30–14:00	Venema joins at restaurant for discussion over future positioning ILLC
14:15–14.45	<i>In Bungehuis, room 1.01</i> Additional meeting with Management ILLC Participants: Batson, Venema
14:45–16.30	Closed evaluation session Preparation of preliminary version of report
16.30–17:30	Plenary session: Committee presents preliminary evaluation results Participants: all ILLC staff & students, Deans of both Faculties Drinks afterwards in Bungehuis canteen

Appendix 3: Bibliometric analysis

In August 2012 the committee received the letter hereunder. The committee agrees with the scientific director's arguments for not including a bibliometric analysis in the self-evaluation report.

Dear members of the committee,

It has been a while since we have been in contact concerning the pending research evaluation of the Institute for Logic, Language and Computation. In the last couple of months, the institute has been busy preparing a detailed self-evaluation report. This report is now almost ready, and it will be sent to you later this month.

One aspect concerning this report that needs a bit of discussion is the nature of the evaluation of our scientific output. As in the last evaluation six years ago, the ILLC has made an explicit decision *not* to undertake a bibliometric analysis.

In some academic disciplines, such an analysis would be considered an integral part of a self-evaluation report, while in others, it would be frowned upon and dismissed as irrelevant and even damaging for the field. Our decision

(at this stage) not to make a bibliometric analysis for the ILLC is based on the following two reasons.

First, the ILLC is a highly interdisciplinary research institute, and its members publish in different fields with very diverse publication traditions, and different conventions concerning the citation of other work. As a consequence, even if it were possible to carry out a meaningful bibliometric analysis of the output of small homogeneous subgroups in the institute, the obtained data would not be meaningful across the institute.

Second, even if we would restrict attention to specific disciplines covered by certain groups within the ILLC, a classical bibliographic analysis would not be of any help. For computer science, for instance, this is a well-known fact that has been clearly argued by the expert committee (of whom Prof.dr. Wiebe van der Hoek was a member) that assessed the Dutch Computer Science Departments in the Netherlands in 2010. For mathematical logic it is not possible to put together a list of top journals that will accept publications in all the fields covered by our staff members, and some of the best journals in the field (such as the Annals of Pure and Applied Logic) have a very low impact factor.

Note that the SEP (Standard Evaluation Protocol, the guiding protocol for research assessment in the Netherlands), recognizes this situation. In particular, it states (page 6) that "institutes and programmes with multi-, inter-, or transdisciplinary research programmes require special attention in the evaluation. It is, for instance, more difficult for these groups to show their results through traditional indicators based on publications in high impact journals, and therefore review committees should include evaluators who have a solid experience in assessing such research. The board responsible for evaluating multi-, inter-, or transdisciplinary research should therefore see to adaptations in the standard procedures necessary to assess these particular aspects of an institute's mission, for example with regard to the composition of the evaluation committee or to specific, more qualitative, criteria and indicators". We believe that you, as our evaluation committee, meet these standards, and will be able to assess the quality of our research output on the basis of a qualitative analysis.

Summarizing, to the best of our knowledge there is no bibliometric method available that would do justice to the variety and quality of our research output. Nevertheless, if you would think differently, we will be happy to follow any concrete suggestion that you have.

Best wishes,

Yde Venema

Scientific Director, ILLC