PPS - Laboratoire preuves, programmes, systèmes

Rapport Hcéres

Department for the evaluation of
research units

AERES report on unit:

Laboratoire Preuves, Programmes et Systèmes

PPS

Under the supervision of
the following institutions
and research bodies:

Université Paris 7 – Denis Diderot

Centre National de la Recherche Scientifique

November 2012

aeres

agence d'évaluation de la recherche et de l'enseignement supérieur

Research Units Department

President of AERES

Didier Houssin

Research Units Department

Department Head

Pierre Glaudes

The president of AERES "signs[...], the evaluation reports, [...]countersigned for each evaluation department by the relevant head of department (Article 9, paragraph 3, of french decree n°2006-1334 dated 3 november 2006, revised).

Grading

Once the visits for the 2012-2013 evaluation campaign had been completed, the chairpersons of the expert committees, who met per disciplinary group, proceeded to attribute a score to the research units in their group (and, when necessary, for these units' in-house teams).

This score (A+, A, B, C) concerned each of the six criteria defined by the AERES.

NN (not-scored) attached to a criteria indicate that this one was not applicable to the particular case of this research unit or this team.

Criterion 1 - C1 : Scientific outputs and quality ;
Criterion 2 - C2 : Academic reputation and appeal ;
Criterion 3 - C3 : Interactions with the social, economic and cultural environment ;
Criterion 4 - C4 : Organisation and life of the institution (or of the team) ;
Criterion 5 - C5 : Involvement in training through research ;
Criterion 6 - C6 : Strategy and five-year plan.

With respect to this score, the research unit concerned by this report received the following grades:

● Grading table of the unit: Laboratoire Preuves, Programmes et Systèmes PPS

C1	C2	C3	C4	C5	C6
A+	A+	A+	A	A+	A

Evaluation report

Unit name:	Laboratoire Preuves, Programmes et Systèmes
Unit acronym:	PPS
Label requested:	UMR
Present no.:	7126
Name of Director (2012-2013):	Mr Thomas EHRHARD
Name of Project Leader (2014-2018):	Mr Thomas EHRHARD

Expert committee members

Chair: Mr Jean-Michel MULLER, CNRS, Lyon

Experts: Mr Gilles BARTHE, IMDEA Software Institute, Madrid, Spain

Mr Claude JARD, Université de Nantes, CNU delegate

Mr Jean-Jacques LEVY, INRIA, Rocquencourt

Mr Luke ONG, University of Oxford, United Kingdom

Ms Sophie TISON, Université de Lille, CoNRS delegate

Scientific delegate representing the AERES:

Mr Olivier ROUX

Representative(s) of the unit's supervising institutions and bodies:

Mr Michel BIDOIT, CNRS

Mr Marc ROBERT, Université Paris Diderot

1 ● Introduction

History and geographical location of the unit:

PPS was created in 1999. It mainly gathered computer scientists originated from LIENS laboratory and logicians from Université Paris Diderot. It is a common laboratory of CNRS and Université Paris Diderot (UMR 7126). At the time of the visit, it is located Rue du Chevaleret, but should soon move in the Sophie Germain building of the new campus of Université Paris Diderot.

Management team:

The laboratory is headed by Mr Thomas EHRHARD (DR CNRS).

AERES nomenclature:

ST6 Sciences et technologies de l'information et de la communication

ST1 Mathématiques

Unit workforce:

Unit workforce	Number as at 30/06/2012	Number as at 01/01/2014	2014-2018 Number of project producers
N1: Permanent professors and similar positions	24	20	18
N2: Permanent researchers from Institutions and similar positions	18	16	16
N3: Other permanent staff (without research duties)	7	2	
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)	0	0	
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)	29	0	
N6: Other contractual staff (without research duties)	0	0	
TOTAL N1 to N6	78	38	34

Percentage of producers	*94.44 %*

Unit workforce	Number as at 30/06/2012	Number as at 01/01/2014
Doctoral students	16	
Theses defended	32	
Postdoctoral students having spent at least 12 months in the unit*	27	
Number of Research Supervisor Qualifications (HDR) taken	4	
Qualified research supervisors (with an HDR) or similar positions	20	14

2 • Assessment of the unit

Strengths and opportunities:

The quality of the research is excellent, as well as the academic reputation of the unit.

There is an exceptional concentration of experts of the mathematical foundations of programming, and of the connexions between proofs, types and computation.

The recruitment and training of PhD students is excellent.

PPS has outstanding initiatives in software development, including the current development of Coq.

Weaknesses and threats:

There is a lack of engineers for helping with the software development and maintenance.

There is a rather small number of PhD students.

There is a lack of a significant teaching remission for beginning "maîtres de conférences" and for people preparing an "Habilitation".

The number of "professeurs" is too small.

Recommendations:

CNRS and/or Université Diderot should consider recruiting an *Ingénieur de Recherches* for the software development of PPS.

The laboratory, the "UFR d'Informatique" and Université Paris Diderot should find a way for providing a significant (say, around 1/3) teaching remission to junior "Maîtres de Conférences".

The laboratory should hire more PhD students (possibly at the price of being slightly less selective in the recruitment).

The laboratory should recruit professors over the next couple of years.

The committee strongly backs all efforts for strengthening the links between LIAFA and PPS.

3 ● Detailed assessments

PPS (*Preuves, Programmes et Systèmes*) gathers computer scientists and mathematicians interested in the mathematical foundations of program and proof construction. The organisation of PPS is essentially informal. There are no real «teams» in PPS. Merely, there are three different federating «themes»: proofs and types (21 permanent members); mathematical foundations of programming (19 permanent members); and system modelling, analysis and design (15 permanent members). These themes are more a way of presenting the activities of the laboratory than a rigid structure, and most researchers participate to two themes (especially, the first two themes have 11 common permanent members). Peculiar as it may look, this organisation certainly played an important role in the undeniable success of PPS in gathering people from quite different scientific origins and allowing them to build a common expertise. It works because of the relatively small size of the laboratory: a larger laboratory would need more structure. The laboratory has a joint INRIA team: pi.r2 (one of its major tasks is the development and maintenance of the Coq proof assistant), created in 2008.

PPS grew very significantly during the period covered by the evaluation (+5 PR/MCF, +6 permanent researchers). Concerning the recruitment of permanent members with a teaching and research position (PR/MCF), among the 5 persons recruited since 2007, only one was already a PPS member.

PPS participates to the Labex "Sciences Mathématiques de Paris" (SMP). There is also a significant involvement of PPS in the GDR IM (Informatique Mathématique) and GDR Théorie des jeux: modélisation mathématique et applications, and a participation to GDR Topologie algébrique et applications. Also, PPS is involved in many national projects (including 19 ANR projects), 2 FP6 and 2 FP7 European projects, as well as several bilateral projects.

Assessment of scientific quality and outputs:

The scientific output of PPS is at the highest international level. PPS is very visible in the top publication venues in semantics of computation, notably LICS, but also POPL, ICALP, CSL, FoSSaCS, ICFP, TLCA, RTA, etc. The Lab also has a strong presence in the top journals in semantics such as LMCS, MSCS and TCS. During the considered period, PPS members published 112 international journal papers, and 164 peer-reviewed international conference papers. PPS also has a significant involvement in software development, major examples being the Ocsigen web server, the maintenance of the Coq proof assistant, and the founding or IRILL (Initiative de Recherche et d'Innovation sur le Logiciel Libre), which is a joint INRIA, Université Diderot and Université Pierre et Marie Curie structure, devoted to free software, created in 2010.

Assessment of the unit's academic reputation and appeal:

PPS has an excellent international reputation, which clearly shows through many indicators:

- an impressive list of prizes (pre-doctoral Gödel prize, Ackerman Prize, "prix EADS de la meilleure these", "Prix de thèse ASTI", ACM SIGSOFT distinguished paper award, Microsoft research distinguished artifact award, etc.);

- a remarkable participation to the steering committee and/or Program committee of international conferences, and to the editorial board of some major international journals (Theoretical computer science, Mathematical structures in computer science);

- the invited researchers hosted by PPS (nearly 70 during the considered period) include many of the top names in semantics; This is a highly effective scheme to promote research within the Lab and foster collaboration; It is of course also testament to the high standing of the PPS esteemed by others in the community worldwide;

- one should also mention the co-organisation, by PPS members, of 2 major international conferences: RDP'2007 and LC'2010, as well as 16 workshops/summer schools;

Assessment of the unit's interaction with the social, economic and cultural environment:

Concerning software development and interaction with the economic environment, the situation has much improved since the last visit. Especially,

- IRILL is a very positive development initiative;

- INRIA and PPS co-steer Coq. Coq is very widely used in high quality programming and verification. It is used by the top people in programming languages in the world. A sizeable number of POPL papers actually use Coq for verifying part of their results;

- the committee notices that two projects of startup companies are emerging from the work of PPS researchers

PPS also has a collaboration with Esterel technologies. The laboratory is clearly open to the other disciplines and to the other aspects of computer science. However, to be able to pursue its ambitious policy of software development, PPS should recruit at least one full time engineer: CNRS and/or Université Diderot should consider assigning an "Ingénieur de Recherche" to PPS, for its software development, a priority.

Assessment of the unit's organisation and life:

As explained above, PPS is not organised formally into teams. Its scientific work is presented under three main themes. There are a number of regular, well-attended working groups covering topics that cut across the themes. There is also a general seminar, and a PhD seminar (common with LIAFA). The major software development efforts of the laboratory are under the auspices of the joint research team pi.r2 on the one hand, and the IRILL initiative on the other. The management style of PPS is "free and easy". Given that PPS is not a huge research laboratory, this informal, project-driven approach to management seems to serve it well. On the whole the PPS members are very satisfied with the current organisation and appreciate not being divided in teams.

Certain topics do not have a working group. A number of highly productive researchers seem to work alone (there is nothing wrong with that per se). It may be worth encouraging a "working group lite", meeting once per month perhaps; or thematic half-day or whole-day seminars comprising both PPS members and external invited speakers.

A real concern is the lack of a significant teaching remission for junior "maîtres de conférences", and (although this is slightly less critical since they have the possibility of applying for a sabbatical period to CNRS) for more senior ones willing to prepare an HDR.

There is a similar problem for senior people with a teaching position and very significant responsibilities: it is sometimes difficult for them to do all the things they are supposed to do (e.g., participation to CNU, or coordination of european projects) with a very small teaching remission only. Also, there should be more professors in PPS. We understand that it is hard to find someone of the right profile and standing. But this process of renewal will soon become urgent, as the founder of the PPS approaches retirement. PPS and Université Paris Diderot should consider recruiting professors—there is no doubt that PPS can attract them.

There has been a problem of lack of office space for years. The situation should improve very significantly when the laboratory moves in the Sophie Germain building of the new campus of Université Paris Diderot. The move will also allow the pi.r2 team to be in the same building as the other PPS members (which, as we are writing these lines, is not yet the case).

There is only one permanent administrative person plus one part-time, non-permanent, which is not much. Both are appointed by CNRS. The "Conseil de Laboratoire", which meets on average once every two months, is the place where the major administrative and scientific decisions are made.

The basic funding of the laboratory per year (excluding the salary of permanent members) is around 35k€ from CNRS + 70k€ from Université Paris Diderot. One must add to that around 340 k€ of funding through european projects and around 350 k€ of ANR funding. The total funding for 2011 was around 750 k€. This is rather well balanced.

Assessment of the unit's involvement in training through research:

The committee is impressed by the number of awards won by the PhD students of PPS. The associated Doctoral School is ED 386 (Sciences mathématiques de Paris centre). PPS has an impressive record of producing some of the very strongest PhD graduates in semantics of computation, broadly construed. The students are very satisfied with the way they are handled. They are funded for going to conferences or summer schools, and well equipped. All those who want can teach. The common PhD seminar between LIAFA and PPS works well. There are 2 talks/month, balanced between LIAFA and PPS, with a good attendance. 3 PhD students gave up during the period.

The number of postdocs and PhD students seems a little low by comparison with university departments in Europe that have ambitions to be world-leading (during the period under consideration, the average number of PhD students is 18). This is partly correlated with the relatively low number of members having an HDR. Important factors seem to be a very selective (too elitist?) recruitment and the lack of PhD funding. This is a very good reason for PPS to be more active in applying for funding, both national and international.

Among the 45 M1, M2 & Engineer school students who had a training period in PPS, 21 originated from MPRI ("Master Parisien de Recherche en Informatique"). This shows a strong involvement of PPS in MPRI. Furthermore, PPS members have been involved in 14 courses in MPRI (and 9 courses in Master LFMI: "Logique Mathématique et Fondements de l'Informatique").

Assessment of the five-year plan and strategy:

Concerning the global scientific project presented by PPS, the committee is impressed by the vision of broadening the Curry-Howard Isomorphism to encompass

1. resources - giving expressions to quantitative reasoning,

2. effects - from "reverse informatics" to complexity-bounded subsystems of Coq,

3. dependent types - new insights from homotopy theory and their ramifications in the evolution of Coq.

The vision is certainly bold, but not implausible. To achieve it, one would need new mathematical insights, a critical mass of talents, and a research environment that is optimistic, open-minded and outward-looking. Not many research centres have these prerequisites.

The presented policy for the 5 years to come mainly consists in

- maintaining the scientific unity of the lab, yet supporting some pluridisciplinarity (mathematics, biology, ...) and industrial applications;

- locally, building a strong computer science department in Paris Diderot University, and strengthening the link with other parisian labs;

- enforcing scientific cooperation with LIAFA, by identifying common topics of interest: game semantics, distributed computing and concurrency, Combinatorics, and Proofs, certification and verification.

A vice-director of the lab will be appointed, and a "comité de direction" should be created to assist the director in the daily administration and animation.

In 2010, the INS2I Institute of CNRS suggested that LIAFA and PPS should consider the idea of merging. A committee was formed to elaborate a proposal that was released in early 2012. Both laboratories voted on the project. The vote of LIAFA was positive, and the vote of PPS was negative. The rationale behind the project was to gain even more visibility by building a major player in fundamental computer science. Also, it would have given more weight to computer science locally (e.g., in the IDEX Sorbonne Paris Cité), and facilitated local management. A consequence of the vote is that a merger is not presented in the submitted 5-year project. However, both labs—which already cooperate quite well on some important issues such as recruitment of Paris Diderot professors or assistant professors—wish to facilitate scientific collaboration between their members: there is already a a PhD-student seminar that works very well, there is a project of a "didactic" seminar, of joint seminars on topics of common interest, a common "maître de conférences" position will be opened at the interface of LIAFA and PPS, etc.

As written in the activity report of PPS, "they would gain a lot in strengthening their scientific links". The committee strongly backs the different actions taken to encourage cooperation between LIAFA and PPS. The four common themes of interest identified make a compelling scientific case of how that cooperation can cross-fertilise research. PPS and LIAFA together would amount to a big department of computer science that covers most topics in the theory of computer science and that would raise its profile and strengthen its bargaining position when competing for regional and national resources.

4-b ● Theme-by-theme analysis

Theme 1: Proofs and types

Workforce

Theme workforce in Full Time Equivalents	As at 30/06/2012	As at 01/01/2014
FTE for permanent professors	8.5	8.5
FTE for permanent EPST or EPIC researchers	6.5	6.5
FTE of other permanent staff without research duties (IR, IE, PRAG, etc.)		
FTE for other professors (PREM, ECC, etc.)		
FTE for postdoctoral students having spent at least 12 months in the unit		
FTE for other EPST or EPIC researchers (DREM, etc.) excluding postdoctoral students		
FTE for other contractual staff without research duties		
FTE for doctoral students		
TOTAL	15	15

● Detailed assessments

The Proofs and Types theme comprises 21 researchers (3 "professeurs", 9 "maîtres de conférences", 4 "directeurs de recherches", 5 "chargés de recherches"). It is more oriented towards models of computations and logic than towards the theory of programming languages. During the last 5 years, the theme participated to the development of 2 exceptional softwares, the Coq proof assistant, widely used internationally, and CDuce a functional language for XML data processing. The theme has also good score in publications: 7 articles at LICS, 2 at POPL, 1 at ICFP (3 major international conferences); 2 articles at JFP, 2 at Information and Computation, 1 at JACM, 1 at ACM TOPLAS (all excellent journals). Moreover 6 PhDs have been defended under supervision of a member of PPS.

The numerous topics are well chosen: lambda-calculus and dynamic patterns, XML data processing, security, computer-assisted proofs, proof theory, linear logic, type theory, resource control, differential linear logic. Some are very theoretical, others are more directed to implementations. They all share a common knowledge about lambda-calculus, types and constructive logic.

The parts on rewriting + lambda-calculus and the dependent types have an active and exemplary publication rate. The XML chapter is high in quality of publication. The proof theoretic subsections are more concerned by conferences in mathematical logic, with an impressive score at the LICS well-known conference.

At the review, we had no demos of the 2 software tools: CDuce and Coq (however, we had a nice presentation). But it is widely acknowledged that Coq became a basic tool for many worldwide researchers in the theory of programming languages, verification of programs, properties of security, or the formalization of mathematics. A significant part of the papers presented at the annual POPL conference is now using Coq.

Therefore, the development of Coq became critical, not only for PPS, but for the overall research community. There is clearly a lack of engineering support in this task. Furthermore, some of the developers should reserve more time to publish articles, not necessarily theoretical.

There are not so many projects targeted to the theory of programming languages in the theme. CDuce seems is one of them. Several parts of the Coq research (for instance the dependent types) could also be related to programming languages. But more effort could be developed in this direction.

The rewriting and security is a small subpart of the theme, although security became an important research topic, with the development of networks and distributed applications. Much of the work of formal methods for programming and programming languages is applicable, and curiously lacks in the PPS projects.

But clearly this theme Proofs and Types is very strong. The researchers are top in their respective domains. Their organization in a single unit is almost unique in the world

Conclusion:

● Overall opinion of the theme:

This is a strong theme with worldwide class research.

● Strengths and opportunities:

This theme has excellent theoretical research with participation to the most prestigious international conferences. Moreover, the Coq system started at Inria now represents an important effort at PPS with highest impact on the global research community. The theme also organises a well-attended seminar.

● Weaknesses and threats:

There could be a better impact of the theme in conferences about Programming Languages and Security. For Coq, the interface between developers and users must be improved with engineering support. The future of Coq, although essential, is unclear. The number of PhD students could be increased.

● Recommendations:

There is no doubt about the validity of this research in the next period. Try to respond to the above weakness remarks.

Theme 2:   Mathematical foundations of programming

Workforce

Theme workforce in Full Time Equivalents	As at 30/06/2012	As at 01/01/2014
FTE for permanent professors	5	5
FTE for permanent EPST or EPIC researchers	6	6
FTE of other permanent staff without research duties (IR, IE, PRAG, etc.)	0,5	0,5
FTE for other professors (PREM, ECC, etc.)		
FTE for postdoctoral students having spent at least 12 months in the unit		
FTE for other EPST or EPIC researchers (DREM, etc.) excluding postdoctoral students		
FTE for other contractual staff without research duties		
FTE for doctoral students		
TOTAL	11,5	11,5

• Detailed assessments

The Mathematical foundations of programming theme has a total of 19 members (1 "professeur", 8 "maîtres de conférences", 3 "directeurs de recherches", 6 "chargés de recherches" and 1 "ingénieur de recherches"). Research conducted under the theme ranges from the classical to the emerging topics in semantics of computation, using mainly methods in mathematical logic but also techniques and ideas in pure and abstract mathematics.

- Game semantics and interactive models of computation. PPS is one of the few international research hubs in game semantics. Many topics have been studied, using a variety of approaches, both abstract and concrete. Several strands stand out: a compelling categorical explanation of the combinatorics underpinning the construction of innocent strategies; an elegant deconstruction of game semantics in terms of dialogue categories and tensorial logic; abstract machines for dialogue games; and a game-semantic perspective of ludics and its applications to concurrency.

- Linear logic and ludics. A pioneer in Linear Logic, PPS has maintained its leading role; the work produced continues to be cutting edge. There have been advances in denotational models of differential linear logic leading to a new understanding of the resource lambda-calculus, and abstract accounts of the exponential modality.

- Domain theory and models of lambda calculus. The contributions here are manifold. There have been advances that make new connections with classical results, such as model theory of the pure untyped lambda-calculus; discovery of new domains such as probabilistic coherence spaces and monad-free semantics of non-determinism; and the domain-theoretic modeling of new computational phenomena, such as random variables.

- Realizability and models of set theory. This is a systematic and wide-ranging program to develop a computational theory of classical realizability in the logical language of set theory. Results include news methods of realizing choice principles, stateful interactive realizability with tantalising connections to forcing, and developments in map theory. The sustained effort is bearing fruits of new programming perspectives. A recent innovation gives a computational reading of forcing, which promises to yield new and exciting programming applications.

- Applications of pure and abstract mathematics to computation. Examples include free models of operadic theories, connections between operands and monads as mediated by distributive laws, homotopy-theoretic accounts of concurrency, and higher-dimensional rewriting and applications to homotopy theory and higher categories. PPS is one of a very small number of centers in the world where such mathematical thinking flourishes. This is a standout feature that goes back to PPS' roots.

Conclusion:

● Overall opinion of the theme:

PPS continues to produce innovative and trend-setting research in many topics in the mathematical foundations of programming. It is one of a handful of truly excellent research centres in semantics of computation, world-wide.

● Strengths and opportunities:

A key strength is its pool of superbly talented researchers who have been given free rein to pursue their own research agenda. Another is a highly conducive research environment characterised by optimism and an open and outward-looking mindset. Not many research centres have these qualities.

There are two exciting opportunities:

- PPS, in collaboration with INRIA, is in a uniquely influential position to steer the development of Coq, whose success is widely acknowledged. It is in an equally strong position to contribute to the mathematical / logical and computational foundations that underpin Coq and other reasoning assistants. It should strengthen its resources to advance the twin roles.

- Another is the presence of LIAFA on the same site. There are many opportunities for cross-fertilisation of research.

● Weaknesses and threats:

There is a risk of the relatively small group working in applications of abstract mathematics such as homotopy theory feeling isolated.

The senior people of the theme are either retired or near retirement. There is an urgent need for leadership renewal.

The research is generally of the highest quality. It can increase its impact by interacting / collaborating with researchers in programming languages and security.

● Recommendations:

Seek to recruit professors over the next couple of years.

Theme 3:   Modeling, analyzing and conceiving systems

Workforce

Theme workforce in Full Time Equivalents	As at 30/06/2012	As at 01/01/2014
FTE for permanent professors	6.5	6.5
FTE for permanent EPST or EPIC researchers	3.5	3.5
FTE of other permanent staff without research duties (IR, IE, PRAG, etc.)	0,5	0,5
FTE for other professors (PREM, ECC, etc.)		
FTE for postdoctoral students having spent at least 12 months in the unit		
FTE for other EPST or EPIC researchers (DREM, etc.) excluding postdoctoral students		
FTE for other contractual staff without research duties		
FTE for doctoral students		
TOTAL	10,5	10,5

• Detailed assessments

The theme "Modeling, Analyzing and Conceiving Systems" involves 15 permanent researchers (3 "professeurs", 6 "maîtres de conférence", 1 "directeur de recherches", 4 "chargés de recherches", 1 "ingénieur de recherches"). Its main axes are the design and analysis of models, and the development of software systems. During the evaluation period, the theme has made significant contributions to the deployment and installation of software packages, and has been involved in the creation of IRILL. The theme is doing well in terms of funding, international collaborations, software developments, and publications.

One axis applies the semantical methods that form the common ground of the PPS laboratory, and in particular process calculi, to the design and analysis of models for systems biology, concurrency, service oriented programming, reversibility and causality, and probabilistic systems. Several topics are doing very well in terms of publications and international visibility. For instance, the research on systems biology is the fruit of long-standing collaboration with Cambridge, Edinburgh, and Harvard; its outcome has been presented in several important publications, and includes a tool, KaSim, that won an international competition twice. Also, the research on service oriented programming is performed in collaboration with Florence and Turin, and has resulted in publications in some good conferences and journals. Two topics seemingly involve a single participant, and have resulted in very few or even no formal publication. Given the significant breadth of the research activities of the laboratory, the relevance of these topics to achieve its global objectives should be assessed more carefully.

The other axis develops software systems for FOSS (Free and Open Source Software) distributions, for the web, and for networks and concurrency.

The activities on software deployment and installation have been a resounding success, leading to publications in excellent conferences (CBSE, SPLC, ESEC/FSE), two ACM Distinguished Paper Awards, and one Distinguished Artifact Award from Microsoft Research. Moreover, participants in the theme have been actively involved in the organization of international competitions of upgrade problem solving, and in the definition of a common format for upgrade and installation problems. More generally, participants in the theme are actively involved in the FOSS community, contributing to the high visibility of PPS beyond its historical strengths. The activities around web programming have reached maturity, and there are preliminary plans to create a start-up to promote Ocsigen. The main activities around concurrency are the development of continuation passing C, which was recently presented during a tutorial at POPL, and Babel/Babel-Z.

The plan for the next period is to focus on the strengths of the theme, and to cover four topics: complex software systems, systems biology, programming for the web, and concurrency theory. The plan is ambitious, and leverages on the successes of the current period to tackle new challenges.

Conclusion:

● Overall opinion of the theme:

It is a strong theme that clearly benefits from the culture of the laboratory, and interactions with the other themes.

● Strengths and opportunities:

The research on systems biology and complex software systems is world class, and several software projects are very successful (from these topics, and also from programming for the web and concurrency). There are opportunities to collaborate with LIAFA on some topics.

● Weaknesses and threats:

There is a risk that participants in the theme spread themselves too thin, partly because of the many software development projects, and to a critical lack of support (programmers, software engineers) to assist some large scale projects.

● Recommendations:

The committee encourages the theme to pursue its activities for the next period.

5 ● Conduct of the visit

Visit dates:

Start: November 30th, 2012 at 8:20

End: November 30th, 2012 at 18:00

Visit site(s):

The PPS offices, and a meeting room

Institution:

Université Paris 7 – Denis Diderot

Address (no. street town):

175 rue du Chevaleret, Paris

Conduct or programm of visit:

The visit was very well organized. The presentation of the lab was very comprehensive, and the committee appreciated 4 very interesting scientific presentations. The committee could freely discuss with all members of PPS, including the PhD students, and representatives of Université Denis Diderot and CNRS. Here below is the program.

8h30 - 9h00 réunion à huis clos du comité d'évaluation

9h00 – 10h00 présentation générale par le directeur

10h00 - 10h35 exposé scientifique – Mr Stefano ZACCHIROLI

10h35 - 10h50 pause

10h50 - 11h25 exposé scientifique – Ms Christine TASSON

11h25 - 12h00 exposé scientifique – Mr Yann REGIS-GIANAS

12h00 - 12h35 exposé scientifique – Mr Juliusz CHROBOCZEK

12h35 - 14h00 déjeuner

14h00 - 14h45 discussion avec les tutelles

14h45 - 15h30 rencontre avec les chercheurs et enseignant-chercheurs

15h30 – 16h00 rencontre avec les doctorants

16h00 - 16h30 pause

16h30 - 17h00 rencontre avec les ITA/IATOSS

17h00 - 17h30 rencontre avec la direction

17h30 - 18h30 réunion à huis clos du comité

18h30 fin de la visite
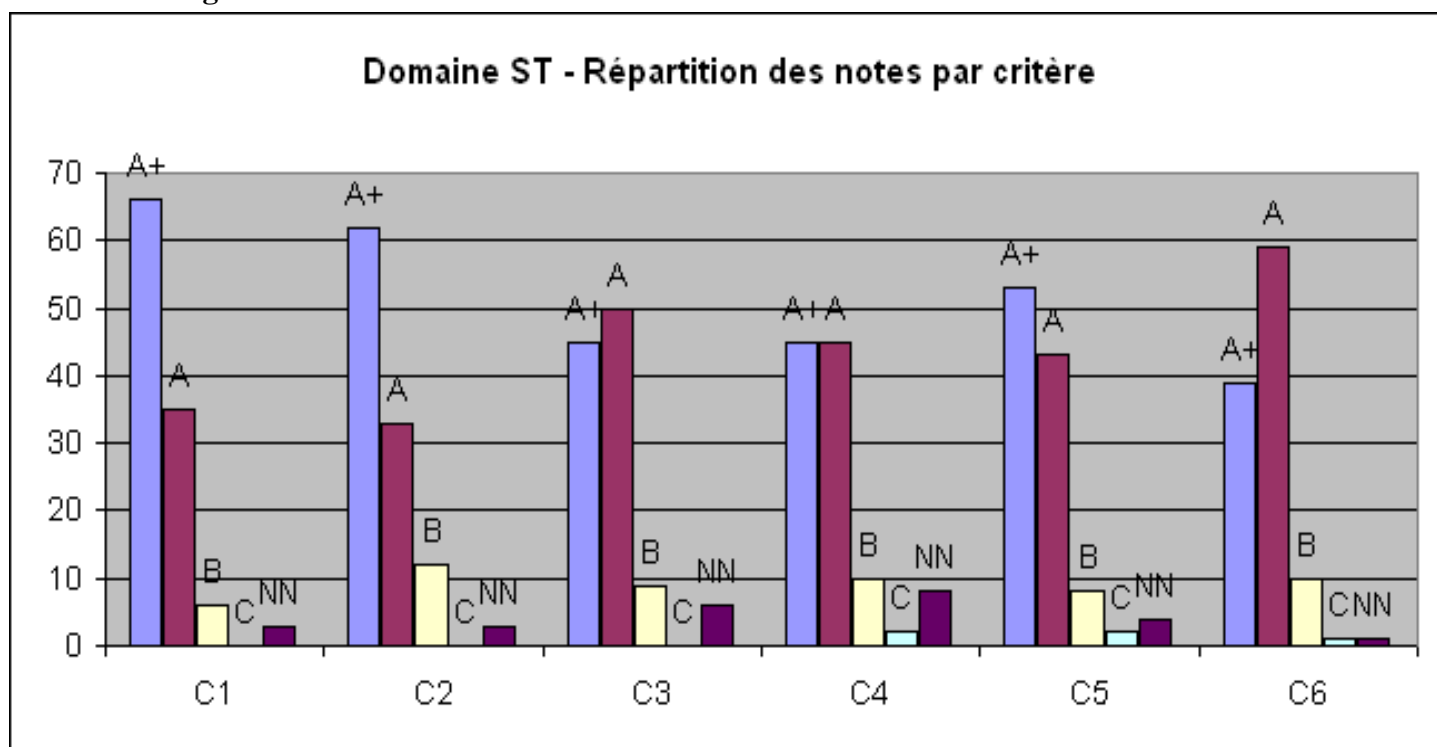
6 ● Statistics by field: ST on 10/06/2013

Grades

Critères	C1 Qualité scientifique et production	C2 Rayonnement et attractivité académiques	C3 Relations avec l'environnement social, économique et culturel	C4 Organisation et vie de l'entité	C5 Implication dans la formation par la recherche	C6 Stratégie et projet à cinq ans
A+	66	62	45	45	53	39
A	35	33	50	45	43	59
B	6	12	9	10	8	10
C	0	0	0	2	2	1
Non Noté	3	3	6	8	4	1

Percentages

Critères	C1 Qualité scientifique et production	C2 Rayonnement et attractivité académiques	C3 Relations avec l'environnement social, économique et culturel	C4 Organisation et vie de l'entité	C5 Implication dans la formation par la recherche	C6 Stratégie et projet à cinq ans
A+	60%	56%	41%	41%	48%	35%
A	32%	30%	45%	41%	39%	54%
B	5%	11%	8%	9%	7%	9%
C	0%	0%	0%	2%	2%	1%
Non Noté	3%	3%	5%	7%	4%	1%

Histogram

Domaine ST - Répartition des notes par critère

7 • Supervising bodies' general comments

P/VB/NC/YM – 2013 - *121*
Paris, le 26 avril 2013

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Directeur de la section des unités de l'AERES
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S2PUR140006392 - Laboratoire Preuves, programmes Systèmes - PPS - 0751723R

Monsieur le Directeur,

Je tiens en premier lieu à remercier les membres du comité de visite de l'AERES pour la production du rapport sur la situation du Laboratoire Preuves, Programmes et Systèmes, rapport très élogieux, qui souligne l'excellente qualité de la recherche qui y est produite, attestée par le haut niveau qualitatif et quantitatif des publications, tant au niveau national qu'international.

Je me réjouis des commentaires élogieux sur la participation de l'équipe au Labex "Sciences Mathématiques de Paris" et sur la liste remarquable des prix internationaux obtenus par le laboratoire.

Le comité mentionne à plusieurs reprises la nécessité de renforcer en moyens humains cette unité. L'Université en a conscience et devra réfléchir avec ses partenaires institutionnels à ce renforcement.

Le comité mentionne aussi la nécessité de renforcer les liens entre le laboratoire PPS et le LIAFA. L'Université, en fonction de ses moyens, aidera à ce rapprochement, dans la mesure où les membres de ces équipes convergent sur ce projet.

Je vous prie d'agréer, Monsieur le Directeur, l'expression de toute ma considération.

Vincent Berger

PREUVES
PROGRAMMES
SYSTÈMES

UMR 7126

9 avril 2013

Objet : réponse au rapport d'évaluatioon AERES de l'UMR 7126

En tant que directeur du laboratoire PPS, je remercie le comité d'évaluation AERES pour le travail qu'il a effectué et pour la qualité des discussions que nous avons eues lors de sa visite.

Je prends bonne note de ses recommandations pour la prochain contrat.

Thomas Ehrhard
Directeur de recherche au CNRS
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