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Curriculum vitae of Alban Ponse



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Curriculum vitae of Alban Ponse – Data

- 29-09-1955 Alban Ponse (full name) was born in Nieuwer-Amstel, The Netherlands.
- 25-11-1987 Master's degree in Pure Mathematics (extended version), specialization Logic and foundations, University of Amsterdam.
- 16-03-1988 Employee at the Centrum voor Wiskunde en Informatica (CWI) in Amsterdam, Department of Software Technology, until May 1992.
- 09-06-1992 Doctoral degree in Mathematics and Computer Science, University of Amsterdam.
- 01-04-1993 Assistant professor at the Programming Research Group, Faculty of Mathematics and Computer Science, University of Amsterdam.
- 01-01-2000 Secondment to CWI, Department of Software Technology (one year, 0.8 fte).
- 01-01-2001 Secondment to CWI, Department of Software Technology (one year, 0.4 fte).
- 01-01-2003 Associate professor at the Informatics Institute, Faculty of Science (formerly, Faculty of Mathematics and Computer Science), University of Amsterdam.
- 01-01-2012 Group leader of the section Theory of Computer Science of the Informatics Institute, Faculty of Science, University of Amsterdam.
- 07-04-2014 BKO-certification.

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Curriculum vitae of Alban Ponse – Description

A brief description of my studies at the University of Amsterdam, working years at the Centrum voor Wiskunde en Informatica (CWI), and my subsequent career at the University of Amsterdam (UvA).

Studies in Mathematics at UvA (1975 - 1987, with interruptions).

Major: Pure mathematics extended, specialization: Logic and foundations.

Compartments: large minor in Computer Science (40 study points), minor in Didactics of mathematics (16 study points).

Some facts:

1. Doctoral Thesis was published. ¹
2. Second-degree and first-degree mathematics teaching qualifications obtained.
3. Doctoral Program exceeded the required size with 50%, and the duration of my studies was influenced by the (voluntary) provision of my own maintenance.

CWI-period (1988 - 1992). Project assistant at the Department of Software Technology.

Research: mainly on the process algebraic approach ACP (Algebra of Communicating Processes) of Bergstra and Klop. Design of μ CRL (with Groote and Bergstra), an extension of ACP with data which is still in use for research and education at CWI, VU University Amsterdam, and Eindhoven University of Technology. Intended applications were the formal specification and verification of distributed systems.

A part of the scientific publications that emerged from this research is included in a dissertation that was completed in this period (promotores: Baeten and Bergstra). The above research was conducted on a contract basis in the context of several European research projects.

UvA-period (since 1993). Employed at the Informatics Institute, appointed to the Programming Research group (currently: section Theory of Computer Science). In the following a description of my activities in education, research and administration.

• **Education at UvA.** Since 1993, I provided courses on both Bachelor and Master level in various study programmes with subjects ranging from our own research to standard class material.

In UvA's Computer Science programme (until 2003) the main courses I taught were Software Engineering Practical, Process Algebra I, Process Algebra II, Concurrency and Distributed Systems, and *Processen, modulen en componenten*. In the common first year of the Bachelor *Informatiewetenschappen* (comprising the Computer Science programme) I supervised the project *InformatieWetenschappen* and provided the course *Programmatuur en Architectuur*. All these courses were taught in Dutch, but for most of these, English written material was prescribed.

¹A. Ponse. Encoding types in the Lambek calculus. In J.F.A.K. van Benthem and E. Klein (editors), *Categories, Polymorphism and Unification*, pages 262-276. Centre for Cognitive Science, University of Edinburgh & Institute for Language, Logic and Information, University of Amsterdam, 1987. See [25] in the added publication list.

In the Artificial Intelligence Bachelor programme I provided for several years a course in Prolog based on Bratko's seminal textbook (lectures were also in Dutch).

In the Grid Computing master programme (since 2003) I provided for several years the courses Distributed Programming Methods and Theory and Application of Multi-Threading, and I supervised the Profile project. The first course evolved in 2007 into Concurrency Theory and is also part of the master's programme Logic. These courses were taught in English. The master's programme Grid Computing is currently merged into the joint master Computer Science with VU University Amsterdam (starting September 2013) and with Bob Diertens I designed a new course "Concurrent system design by abstraction" that will be part of this joint master programme.

Further educational tasks comprised the supervision of master students in various UvA-programmes (and occasionally in programs of other universities), and of PhD students. ² Two more educational activities not directly linked to UvA-programmes are these:

1. Provision of a web class for high school students (with Inge Bethke and Bob Diertens, since 2004): Webklas Informatica: "Wat is een programma?" (based on our research theme *Instruction Sequences*). For more information, see <http://tcs.science.uva.nl/WebKlas/>
2. ItsModule: lecturing at three secondary schools in the Hilversum area (2008 - 2009). For more information, see <http://tcs.science.uva.nl/WebKlas/Docent/its.html>

• **Research at UvA.** A basic characteristic of my research in computer science is the development of logical and mathematical solid and manageable theory in the area of programming research. The main research themes I was involved in at UvA are these: ³

Process algebra (since 1988). Design of desirable *features* in process algebra, including their incorporation and checking of practical merits (the development of μ CRL conducted at CWI in 1991-1992 also complies with this characteristic). Examples include the incorporation of conditional constructions with conditions in multivalent logics, and orthogonal bisimilarity.

Instruction sequences (since 1998). Definition of algebraic settings to specify and analyse aspects of instruction sequences that represent computer programs ("Program Algebra"). Behavioural semantics for instruction sequences is defined in Thread Algebra, an algebraic theory developed for this purpose which also addresses the construction of models for various forms of multi-threading.

Meadows (since 2007). A modelling of the rational, real and complex numbers with the property that the multiplicative inverse of 0 is 0. Taking this approach, the investigation of number systems as abstract data types can be carried out within the original framework of algebraic specifications without taking any precautions for partial functions or empty sorts.

Proposition algebra and short-circuit logics (since 2009). An algebraic approach to propositional logic with side effects that models short-circuit evaluation using Hoares ternary conditional connective (comparable to if-then-else) with which the well-known binary connectives and negation can be expressed. Various valuation congruences and structures that model these congruences were defined, and short-circuit logics were introduced as those that are relevant in programming (with sequential binary connectives).

²See <https://staff.fnwi.uva.nl/a.ponse/supervision.php>.

³For a more complete overview, see <https://staff.fnwi.uva.nl/a.ponse/research.php>.

Results of the research undertaken take shape in technical reports and peer reviewed publications, and in education. Furthermore, I participate in common scientific activities such as reviewing manuscripts and maintaining professional contacts with colleagues. Finally, a few facts concerning my research at UvA:

Organizing Committees / Program Committees of workshops and conferences:

Workshop on Assertional Methods (CWI, 1992): OC + PC.
ACP'94 (Utrecht University, 1994) and ACP'95 (Eindhoven University of Technology, 1995), two workshops on process algebra: OC + PC.
Modal Logic and Process Algebra (CWI, 1994): OC + PC.
3rd International Workshop on Formal Methods for Industrial Critical Systems (FMICS'98): OC.
Workshop on Distributed Systems (FCT'99, Iassy - Romania, 1999): PC.
Foundations of Software Science and Computation Structures (FOSSACS'06 - ETAPS 2006): PC.
The 9th International Conference on Relational Methods in Computer Science and the 4th International Workshop on Applications of Kleene Algebra (RelMiCS/AKA 2006): PC.
TCSA 2009, 2010 and 2011 (Theoretical Computer Science day Amsterdam): OC + PC.

Participation in nationally / internationally founded projects:

HCM Cooperation Network EXPRESS (Expressiveness of Languages for Concurrency) (1995 - 1998).
ESPRIT, NADA (New Hardware Design Methods) (1995 - 1998).
SION: Development of a μ CRL Toolkit (postdoc (2 yr) + PhD (4 yr)), Co-applicant, main applicant is Groote (CWI) (1996 - 1999).
NWO, Vrije Competitie: Thread Algebra for Strategic Interleaving (postdoc (2 yr) + PhD (4 yr)), project team (2005 - 2010).

Involvement in PhD-supervision:

H.P. Korver (UvA, 29-06-1994): reading and graduation committee,
J.J. van Wamel (UvA, 15-09-1995): co-supervisor,
J.A. Hillebrand (UvA, 12-12-1996): co-supervisor,
D.J.B. Bosscher (UvA, 23-10-1997): co-promotor,
Y.S. Usenko (TU/e, 02-12-2002): co-supervisor,
M.B. van der Zwaag (UvA, 11-10-2002): co-supervisor,
M. Gattari (University of Siena, 11-02-2005): supervisor,
T.D. Vu (UvA, 13-02-2007): co-promotor,
B. Diertens (UvA, 29-10-2009): co-promotor.

Some other facts:

Tutorial (CHDL'97, 1997): "Grid Protocols based on Synchronous Communication".
Member of the editorial board of the *Journal of Logic and Algebraic Programming* (2001).

Invited speaker at the Dagstuhl Seminar 01081 (2001, *Applications of Kleene Algebra*),
lecture: “Iteration in Process Algebra”.

Invited speaker at the Universität Augsburg (2001),
lecture: “Process Algebra and Recursive Operations”.

Member of IFIP WG1.8 on Concurrency Theory (founded 4 September 2005).

Member of the Association Computability in Europe (since 2008).

• **Managerial tasks at UvA.**

1. Writing / editing of annual reports and self studies (education and research) (since 1994).
2. Member of the Educational committee Informatica (1997 - 1999).
3. Member of the committee Advies Onderwijszaken (2000 - 2002).
4. Contact person for the study programme Medische Informatiekunde, AMC/UvA (1999 - 2003).
5. Chair of the Educational committee Informatica (September 2003 - September 2005).
6. Coordinator of the master programme Software Engineering (September 2004 - September 2005).
7. Coordinator of the master programme Grid Computing (September 2005 - June 2011).
8. Programme manager of the master Grid Computing (June 2011 - March 2013).
9. Group leader of the section Theory of Computer Science of the Informatics Institute (Faculty of Science, UvA) (since January 2012).
10. Advisory member of the Educational committee Informatica at VU University Amsterdam (since January 2012).
11. UvA-Coordinator of the joint master programme Computer Science (registration at VU) (since January 2013).

Curriculum vitae of Alban Ponse – Publications

A rather complete overview of my publications can be found at http://liinwww.ira.uva.de/csibib?query=au:ponsea*%20au:%22alban%20ponse%22&sort=year

Selected publications in reverse chronological order, taken from <https://staff.fnwi.uva.nl/a.ponse/researchpublist/pubs.php> (PDF's of most of these publications can be found at this site).

- [96] J.A. Bergstra and A. Ponse. Three Datatype Defining Rewrite Systems for Datatypes of Integers each extending a Datatype of Naturals. University of Amsterdam, Section Theory of Computer Science, Report TCS1409v2, August 2014. Also available at arXiv:1406.3280v2 [cs.LO], 21 August 2014.
- [95] J.A. Bergstra and A. Ponse. Division by zero in common meadows. University of Amsterdam, Section Theory of Computer Science, Report TCS1410, June 2014. Also available at arXiv:1406.6878v1 [math.RA], 26 June 2014.

- [94] J.A. Bergstra, I. Bethke, and A. Ponse. Equations for formally real meadows. Available at arXiv:1310.5011v3 [math.RA, cs.LO], 18 Oct 2013, this version (v3): 11 Feb 2014.
- [93] J.A. Bergstra and A. Ponse. Signed meadow valued probability mass functions. Available at arXiv:1307.5173v1 [math.LO], 19 Jul 2013.
- [92] J.A. Bergstra and A. Ponse. Periodic single-pass instruction sequences. Available at arXiv:0810.1151v2 [cs.PL], 16 April 2013. (Revision of [79].)
- [91] J.A. Bergstra, I. Bethke, and A. Ponse. Cancellation meadows: a generic basis theorem and some applications. *The Computer Journal*, 56(1): 3-14, 2013. doi:10.1093/comjnl/bxs028. Also available at arXiv:0803.3969v3 [math.RA], 22 May 2013.
- [90] I. Bethke, B. Dierkens, and A. Ponse. Electronic publication in Dutch (course material): *Webklas Informatica: Wat is een programma?*. Section Theory of Computer Science, University of Amsterdam, Edition 2012.
- [89] J.A. Bergstra and A. Ponse. Proposition algebra and short-circuit logic. In F. Arbab and M. Sirjani (editors), *Proceedings of the 4th International Conference on Fundamentals of Software Engineering (FSEN 2011)*, Tehran, LNCS 7141, pages 15-31, Springer-Verlag, 2012.
- [88] I. Bethke, A. Ponse, and P.H. Rodenburg. Preface: This issue is dedicated to Jan Bergstra on the occasion of his sixtieth birthday. *Theoretical Computer Science*, 412(28): 3033-3034, 2011.
- [87] J.A. Bergstra and A. Ponse. Proposition Algebra. *ACM Transactions on Computational Logic*, 12(3), Article 21 (36 pp), 2011.
- [86] J.A. Bergstra and A. Ponse. On Hoare-McCarthy algebras. Available at arXiv:1012.5059v1 [cs.LO], 22 December 2010.
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- [84] A. Ponse and S.H.P. Schroevers. (In Dutch) UvA Webklas Informatica: Wat is een Programma?. In F. Vodegel and M. Loots (eds.). *NIOC Proceedings, Het Nationale Informatica Onderwijs Congres (NIOC) 2009*, 7-8 april 2009. Utrecht. Hogeschool Utrecht, pp. 85-92, 2009. (Published in 2010.)
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- [81] J.A. Bergstra, A. Ponse, and M.B. van der Zwaag. Tuplix calculus. *Scientific Annals of Computer Science*, 18:35-61, 2008. Also available at arXiv:0712.3423v1 [cs.LO], 20 December 2007.
- [80] A. Ponse and M.B. van der Zwaag. Risk assessment for one-counter threads. *Theory of Computing Systems*, 43:563-582, 2008.
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- [75] J.A. Bergstra, I. Bethke, and A. Ponse. Thread algebra and risk assessment services. In Costas Dimitracopoulos, Ludomir Newelski, Dag Normann and John R. Steel (eds.), Proceedings Logic Colloquium 2005, pages 1-17, 2007.
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- [72] J.A. Bergstra, I. Bethke, and A. Ponse. Decision problems for pushdown threads. Acta Informatica, 44(2):75-90, 2007. Appeared earlier as Electronic report PRG0502. Programming Research Group, University of Amsterdam, June 2005. Presented by Jan Bergstra at the Logic Colloquium 2005 (ASL) in Athens. (Abstract appeared as [65].)
- [71] J.A. Bergstra and A. Ponse. Execution architectures for program algebra. Journal of Applied Logic, 5(1):170-192, 2007. (See [17] for an earlier version.)
- [70] A. Ponse and M.B. van der Zwaag. A generalization of ACP using Belnap's logic. Journal of Logic and Algebraic Programming, 70(2):222-235, 2007.
- [69] A. Ponse and M.B. van der Zwaag. A generalization of ACP using Belnap's logic: extended abstract. Electronic Notes in Theoretical Computer Science, 162:287-293, 29 September 2006.
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- [67] J.A. Bergstra and A. Ponse. A bypass of Cohen's impossibility result - extended version on the VX Heavens site in html (and there also offered as a 12-page PDF document), used for a lecture in Security of Systems and Networks at UvA, November 2004. VX Heavens, July 2006. (See also [61].)
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- [56] J.A. Bergstra and A. Ponse. Combining programs and state machines. *Journal of Logic and Algebraic Programming*, 51(2):175-192, 2002. (Special issue on Program Algebra edited by C.A. Middelburg.)
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- [43] J.A. Bergstra, J.A. Hillebrand, and A. Ponse. Grid protocols based on synchronous communication. *Science of Computer Programming*, 29(1&2): 199-233, 1997.
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- [30] A. Ponse et al. Chapter 3 in R. Reed, W. Bouma, M. Dauphin, G.D. Evans, and M. Michel (editors), *SPECS - Specification and Programming Environment for Communicating Software*, pages 105-122. North-Holland, 1993.
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- [26] A. Ponse. Process expressions and Hoare’s logic. *Information and Computation*, 95(2):192-217, 1991.
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Editorial work

- [24] I. Bethke, A. Ponse, and P.H. Rodenburg (guest editors). *Festschrift in Honour of Jan Bergstra*, dedicated to Jan Bergstra on the occasion of his sixtieth birthday. *Theoretical Computer Science*, 412(28), 20 June 2011.
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