Erkki Laitila

PhD (Information technology), Computer engineer

Systems thinking expert

EXPLAINING SOCIETY AS SYSTEMS

Promoting systems thinking

Metayliopisto is an open forum to promote systems thinking in society.
GoodReason is a systems thinking methodology with its generic system architecture
for understanding complexity of society".[1]

Personal data sheet

- Software eng. (1977), MsC (2005), PhD (Symbolic analysis, 2008)
- Systems thinking professional since 2010
- email: erkki.laitila@goodreason.fi & erkkilaitila@gmail.com
- p. 044 256 10 54
- born 2.2.1954
- Valkiapäänkatu 1 G 44, 20610 TURKU Finland
- personal interests: science philosophy, systems thinking, master athletics

Academic skills and practical experience

- Systems thinking methodologies and cybernetics
- Information theory and core computer science (PhD dissertation)
- Problem solving skills: theory, heuristics and engineering, soft system methodology
- Modeling techniques and conceptual analysis, ontologies and simulation by Prolog
- Diagnostics: general theory and software skills. Fault isolation, reliability modeling.
- Software experience: logic programming, analysis, projects (25+ years): planning and
  implementing optimization systems for industry working as an IT - entrepreneur

Jobs

Metayliopisto	Systems scientist, method developer	1.1.2011 - ..
Systeemityöyhdistys	Leader of the Agile IT group	24.1.2011 –
SwMaster Oy	Entrepreneur, CTO	18.5.1987 – 30.8.2011
Jyväskylä University	Researcher	5.10.2009 – 22.10.2009
Jyväskylä University	Post doc	10.9.2008 – 31.12.2008
Jyväskylä University	PhD student	1.1.2006 – 30.4.2008
Safematic Oy	Systems designer	19.12.1984 – 15.5.1987
DE Electronics Oy	Design manager	3.1.1983 – 16.12.1984
A.Seppänen Engineering	IT - designer	1.6.1981 – 31.12.1982
Nokia Oy	Diagnostics expert (DX 200)	4.8.1980 – 31.5.1981
Nokia Oy	Test systems programmer	7.6.1977 – 1.8.1980

18.12.2017   In Turku, Finland

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[1]Metayliopisto: http://metayliopisto.fi

Written books

Erkki Laitila

1. Visual Prolog Perusteet. Teknolit. (1996)
2. Visual Prolog Teollisuuden sovellukset. Teknolit. (1996)
3. Takaisinmallintamisen hyödyntäminen ohjelmistotyössä (gradu 2005)
4. Symbolic Analysis as a Basis for a Program Comprehension Methodology (thesis 2008)
5. Symbolic Analysis as a Program Comprehension Methodology (VDM Publishing 2009)
6. Päättelytekniikka ohjelmisto-ongelmien selvittämiseen (GoodReason, 2010).
7. Johdatus systeemiajatteluun (GoodReason, 2012).
8. Systeemiajattelun tekniikka tehostamassa arkiajattelua (GoodReason, 2015).
9. Yhteiskunnan kehittymisen perusteet! (Metayliopisto, 2017)
10. Ideakirja yhteiskunnan pelastamiseen (Metayliopisto, 2017)

PUBLICATIONS from Logic Programming to Symbolic Analysis[2]

1. *Book about Prolog-programming in Finnish:* Visual Prolog Perusteet, Teknolit/Docendo, 1995, ISBN-952-9823-27-4 (322 p).

2. *Book about practical Prolog-programming in Finnish:* Visual Prolog – Teollisuuden sovellukset. Teknolit/Docendo, 1996, ISBN-952-9823-51-7 (228 p).

3. *In Finnish:* Logiikkaohjelmoinnin ja Prologin kehitysnäkymiä, Logiikka, Matematiikka ja Tietokone-conference, Vantaa 1996, Symposio-sarja, ISBN-951-22-3094-1.

4. Fast Production Control. Invited speak. Practical Applications of Prolog - conference, PAP/PACT. London, 1998 (http://www.amast.org/archive/amast/mail/1998/03/msg00007.html).

5. M.Sc-thesis: Takaisinmallintamisen hyödyntäminen ohjelmistokehityksessä, Jkl.University, 2004.

6. Program Comprehension Theories and Prolog-Based Methodologies, Visual Prolog Language and Applications – conference (VipAlc'06), Faro, Portugal.

7. *In Finnish:* Lähdekoodin symbolinen analysointi tekoälyn näkökulmasta. SCAI-STeP- conference, Espoo, 2006, pp. 103-117 (http://www.stes.fi/scai2006/scai_step_program.pdf).

8. Program Comprehension Theories and Prolog based Methodologies, SCAI-STeP-conference, Espoo, 2006, pp. 133-142 (http://museosuomi.cs.helsinki.fi/publications/2006/hyvonen-et-al-developments-in-artificial-intelligence-and-the-semantic-web-step-2006.pdf).

9. Laitila, E., Legrand, S., Symbolic Atomistic Model for program comprehension. In Mexican International Conference on Artificial Intelligence 2007: (Aguascalientes, Mexico) IEEE CS Press 2008. ISBN 978-0-7695-3124-3, pp.363-372. Best Poster Award (2nd pos).

10. Symbolic Analysis and Atomistic Model as a Basis for a Program Comprehension Methodology. PhD-thesis. Jkl U, 2008. www.jyu.fi/ajankohtaista/arkisto/2008/04/tiedote-2008-04-15-10-04-09-740451/

11. Foundation for Program Understanding, SCAI- conference, Tukholma, 2008 (IOS Press).

12. Atomistic Design Pattern for Programming in Prolog. St.Petersburg 17-19.6.2008. Vip Alc'08-conference (http://download.pdc.dk/vip/vip_alc/2008/VIP-ALC08-Proceedings.pdf).

13. Symbolic Hybrid Programming Tool for Software Understanding. 3rd Int. Workshop on Hybrid Artificial Intelligence Systems. HAIS'2008, Burgos, Spain, Springer LNAI 5271, pp. 499-506.

14. Philosophy of Static, Dynamic and Symbolic Analysis, STEP'2008, Espoo, TKK, pp. 96-106.

15. SymAnalyzer: A Symbolic Analysis Tool for Program Comprehension, CSMR'2009. Kaiserslautern, Germany. https://www.computer.org/csdl/proceedings/csmr/2009/3589/00/3589a325.pdf

16. Symbolic Analysis from Theory to Practice (SteP-conference Espoo, August 2010).

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[2] See: http://www.informatik.uni-trier.de/~ley/db/indices/a-tree/l/Laitila:Erkki.html

Patents

- o Laitila, E. (2001). Method for developing a translator and a corresponding system. Patent: W02093371, PRH, Finland.
  http://patentscope.wipo.int/search/en/WO2002093371

Social media

- o Metayliopisto in FB group:
  https://www.facebook.com/groups/585375794950271/
- o Metayliopisto: http://metayliopisto.fi
- o Symbolic analysis: www.symbolicanalysis.wordpress.com
- o LinkedIn: http://fi.linkedin.com/pub/erkki-laitila/8/29/175
- o Youtube: https://www.youtube.com/results?search_query=meta-yliopisto

Symbolic Analysis as a Basis for Program Comprehension (2009)
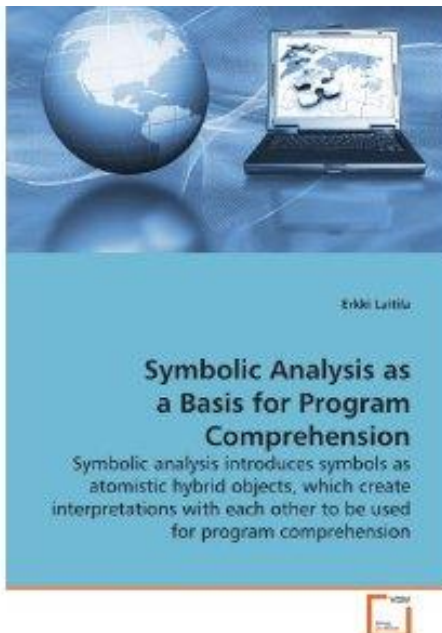
Research on program comprehension is important, because the amount of source code in mission-critical applications is increasing world-wide. As a solution for that challenge, a methodology with four stages is introduced. The first stage, GrammarWare, transforms the program into a symbolic form to function as a construction for the model, as the second stage, ModelWare. For the model the idea of an "atom" is presented to combine the benefits of objects for abstracting, and expressiveness of Prolog for tailoring and formalizing the model. The third stage, SimulationWare, implements a symbolic abstract machine, comparable with traditional Turing machine. With its computation model it enables symbolic analysis, which is comparable with dynamic analysis, but has a rather flexible pragmatics. The last stage, KnowledgeWare, is aimed for collecting knowledge for code inspection, error detection and verification of current operations. The methodology is programmed with Visual Prolog and implemented in a tool, which enables the handling of Java code. The practical goal for the methodology is intelligent support for maintenance tasks.

VDM Publishing. http://www.amazon.com/Symbolic-Analysis-Basis-Program-Comprehension/dp/363916833X/

Päättelytekniikka ohjelmisto-ongelmien ratkaisemiseen (2010)[3]

Ohjelmistokehitys on tunnetusti vaativaa työtä, tiedonhakua, päättelyä, testausta sekä varmistelua ennen ja jälkeen muutosten. Tämä kirja esittelee nimenomaan ongelmien selvittelyyn tarkoitetun, kehittäjän ajattelua tukevan monitasoisen **ORT**-päättelytekniikan, joka ottaa huomioon lähes kaikki koodin piirteet. Päättelytekniikka pohjautuu Laitilan väitöksessään luomaan symbolisen analyysin periaatteeseen, mutta sisältää myös yleisiä kognitiivisia elementtejä ongelmanratkaisun tueksi.

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[3] Lisätietoa:
Blog in English: http://symbolicanalysis.wordpress.com/,
Blogi ongelmanratkaisutekniikat: http://ongelmanratkaisutekniikat.wordpress.com

Systems Thinking Technology for Society and Business

Common sense vs systems thinking

Chapters of the book are:
1. System and evaluation
2. Co-operation: cohesion
3. Society: growth
4. The reader and the ecosystem
5. Ideal future with its world view

The book has 180 pages and 180 colourful pictures about systems and cognitive models for synergy and co-operation and ecosystems.

The book has the goal to create furnishing ecosystems.

Principles of society to get advance

- Explaining system's identity using the eight sector model (GoodReason).
- Numerous examples about society and organizations with their challenges.
- Cybernetics with the viable system model
- Models for Finland
- Solving the inparity problem of economy

The book has 180 pages and 180 colourful pictures about society illustrated by systemic models.
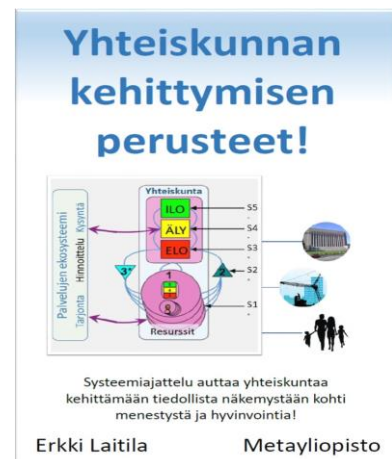
Ideabook for society to correct its systemic distortions

Mahatma Gandhi has warned the world about catastrophes if we cannot make our task to eliminate systemic distortions early enough.
Ideabook lists 10 distortions and corrections for them, including humantistic approach, resilience and wisdom.
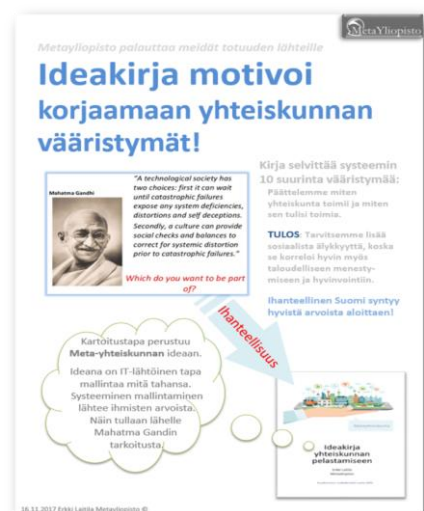
Summary about the industrial experience

- o 1977-1980 Nokia: Programming embedded test systems for Intel's 8080 processors for the whole modem production of Nokia.

- o 1980-1981 Nokia: Diagnostics engineering for Nokia DX200 telephone exhange. Coordinating designers work for how to build diagnostic features to the system. Digital signalling technology and transmission protocols (PCM, HDLC). Multi processor systems 8085, 8086, 80186.

- o 1981-1982 A.Seppänen Engineering Co: Programming process automation systems. HP1000 computer and process station for wood industry. A quality control system.

- o 1982-1983 DE Electronics Ltd: Programming saw-automation systems by assembler. Programmable logics and roof-level industrial systems.

- o 1984-1987 Safematic Ltd: System engineering for implementing a computer based condition control system. Multi-user multi-processor industrial control systems. Digital signal processing and high level planning of large multi-processor systems and real-time operating systems.

- o 1986 Safematic Ltd: Building an order processing system for Safematic.

- o 1986 Skop (Bank) Corporation: Developing expert systems for bank investment consulting.

- o *1987: SwMaster Ltd was founded.*

- o 1987 Safematic: Developing a Basic-to-C-translator for modernizing Basic to C.

- o 1987..1988 Safematic: Developing embedded lubrication automation systems in C.

- o 1989..1990 Nokia: Programming a transmission control processor for a concortion ECR900 (Alcatel, AEG, and Nokia). A standalone processor to monitor BSC installations (Prolog).

- o 1991..1992 Safematic: Programming drivers for data transmission in electricity networks. Implementations were embedded distributed Motorola systems using OS9 operating systems.

- o 1991..1992 Enermet Ltd (later IVO/Fortum): Designing and planning optimizating systems for electricity networks for Vattenfall corporation. Unix, Oracle and embedded SQL.

- o 1994: Writing two books about Prolog (published in 1996). Learning best practice and state-of-the-art of Prolog implementation throughout the world.

- o 1995 M-Real Ltd: Programming an energy optimizating system for a large wood industry corporation (Prolog). High-level economical optimizating and budgeting of industrial companies.

- o 1996 Jyväskylä University: Working as a teacher in Jyväskylä University, a laudatur-seminar about challenging industrial systems and Prolog.

- o 1995 PKC Group: Porting large DOS applications to Windows by building a automatic porting –tool. A large cable-production system was modernized (Prolog).

- o 1995..1997 PKC Ltd: Developing and maintaining a configurating and production control system. The production was delivered for manufacturing cars and trucks of Volvo, Scania etc.

- o 1998..2000 PKC Ltd: Building a distributed production control system (TCP-IP). Each production machine is a client, which is connected into a server, which optimizes the work queues (Prolog). Internet and extranet protocols and company wide networks.

o 1998 Danisco Ltd (Finnfeeds): Designing a production planning system for food industry. An optimizating system to plan month level schedules for logistics of a factory (Prolog & Excel).

o 1997..1998 ESW: A delegate of a national production systems – program (Finnish FIMET-organization). A prototype for fast production control using mass-customization (Prolog).

o 1998 ESW: Being an invited speaker, Practical Applications of Prolog and Contstraints – conference, London with the title *Fast Production Control*.

o 1992..2000 ESW: Being a delegate in 10 PAP-/PACT- conferences. The topics covered practices of agent technologies, Prolog, constraint logic programming and data mining.

o 2000: A prototype for a protocol-to-C code generator to encode GPRS messages (Prolog).

o 2000..2003 SoftaGeneraattori Ltd: A company for source code analyzing was established. Since 2004 development has been continued at SwMaster.

o 2001: Patent for a automatic translator generator and the corresponding translator.

o 2004 Jyväskylä University: Master's thesis: Takaisinmallintamisen käytännön sovelluksia (Practical approaches for software reverse engineering).

o 2004 Elektrobit: Developing and programming a version control system for Nokia S60 smart phones. The code was C++ based on Symbian. Changes between different product installations of smart phones could be traced from a version to another in order to solve software problems.

o 2005 - 2008 Jyväskylä University (May): A dissertation *Symbolic Analysis and Atomistic Model as a Basis for a Program Comprehension Methodology* was finished.

o 2008 Jyväskylä University (September-December): Project coordinator for a Linux mobile software community, Jyväskylä region.

o 2009 Writing a book Symbolic Analysis as a Basis for Program Comprehension.

o 2009-2010 Writing a book : Päättelytekniikka ohjelmisto-ongelmien ratkaisemiseen (Logic for solving software problems).

o 2010: Consulting projects for analyzing source code.

o 2011 Writing a book: Johdatus systeemiajatteluun – GoodReason tekniikka. (Introduction to systems thinking – GoodReason technology).

o 2012-2013 Courses about systems thinking. Public sector: Åbo Akademi, Jyväskylä University, Tampere University. Courses for private sector.

o 2014 Working as a lecture in Jyväskylä University: Systems thinking theory and practices (http://goodreason.fi/systeemiajattelukurssi-jyvaskylan-yliopistossa/).

o 2014 Several new systems thinking courses planned.

o 2015 The book Systeemiajattelun tekniikka tehostamassa arkiajattelua is published.

o 2017 A new book "Yhteiskunnan kehittymisen perusteet".

o 2017 Video set of 100 hours for Metayliopisto for *meta-teaching* is created: multidiscipline, multipurpose multifunction analysis of practical life and society for beginners and practicians.

o 2017 Two books for applying systems thinking for society and business.