

# **Ubiquitous Complex Event Processing**

**- Textbook Project for a new Course of Study –**

**- Support Action for European FET-F –**

**Version V0.2**

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  - 6.5 The problem of how humans would process or react on new event patterns
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#### **7 Deep Dive V: Epigenetics and Cell Biology**

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- 7.5 An individual as a combination of fifty trillion of collaborating event processing cells
- 7.6 Event adapters, Event Processing Agents, Event Processing Networks as the analogy of CEP
- 7.7 Can the “information chemistry” be “programmed” based on U-CEP?
- 7.8 Healthcare: Two examples of increasing future problems – diabetes and depression
- 7.9 A more autonomous and better life based on U-CEP - taking the example of diabetes
- 7.10 Depression - A defect of Event Processing?
- 7.11 Visions about the development of new ICT systems and devices, new generation of systems capable of interfacing with conventional IT systems that are self-replicating, selfrepairing and/or capable of rapid adaptation/evolution as well as flexible reconfiguration in response to changing conditions

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  - 9.3.3 A lot of sensors for different event types (“smart dust”)
  - 9.3.4 An appropriate modeling approach for simulation scenarios
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  - 10.3.1 Simple event patterns, simple (re-) actions – example ??

- 10.3.2 Simple event patterns, complex (re-) actions – example solar storm
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- 10.3.4 Complex event patterns, complex (re-) actions – example ??
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## **11 Deep Dive IX: Universe and Events – Large Hadron Collider of CERN**

- 11.1 Higgs Boson, Higgs Field, Big Bang - From energy to matter
- 11.2 600 million events per second
- 11.3 A lot of sensors for different event types
- 11.4 Event filtering, event enrichment, event processing as cloud computing by more than 100.000 computers, at present C++ coded
- 11.5 Strategy for the detection of the Higgs boson
- 11.6 Can it be better solved by a CEP approach?
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- 11.8 Is there a need for a flexible and fast changing EP-logic?

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- 12.1 A reference model for U-CEP
- 12.2 A reference architecture

### **13 Modeling Languages**

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- 13.2 Unified Modeling Language and its notations/diagrams for modeling dynamics
- 13.3 Agent Based Modeling approaches  
[http://en.wikipedia.org/wiki/Agent-based\\_model](http://en.wikipedia.org/wiki/Agent-based_model), see also Ron Sun in ref-list of “Beyond Simple...”
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# Literature and Materials

## Part I: Getting Started – Signals, Events, Emergences

### 1 Introduction

#### 1.1 Topics for 2020 and Beyond – the European Future and Emerging Technologies Flagship Initiative

- ISTAG paper and topics

[ftp://ftp.cordis.europa.eu/pub/fp7/ict/docs/fet-proactive/press-17\\_en.pdf](ftp://ftp.cordis.europa.eu/pub/fp7/ict/docs/fet-proactive/press-17_en.pdf)

- Agenda, presentations and paper sketches of the Brussels FET workshop June 2010

[http://cordis.europa.eu/fp7/ict/fet-proactive/flagship-ws-june10\\_en.html](http://cordis.europa.eu/fp7/ict/fet-proactive/flagship-ws-june10_en.html)

[http://cordis.europa.eu/fp7/ict/fet-proactive/docs/flagshipcons09-01\\_en.pdf](http://cordis.europa.eu/fp7/ict/fet-proactive/docs/flagshipcons09-01_en.pdf)

#### 1.2 Research programs from U.S. (NSF) and Asia

- US - National Science Foundation

<http://www.nsf.gov/pubs/2009/nsf09559/nsf09559.htm>

- US – National Academy of Engineering of National Academies

<http://www.engineeringchallenges.org/>

#### 1.3 Recent technology forecasts

- “Singularity is Near” and Ray Kurzweil’s forecast

Ray Kurzweil: The Singularity Is Near: When Humans Transcend Biology. Viking Adult 2005

<http://www.independent.co.uk/news/science/by-2040-you-will-be-able-to-upload-your-brain-1792555.html>

[http://en.wikipedia.org/wiki/Raymond\\_Kurzweil](http://en.wikipedia.org/wiki/Raymond_Kurzweil)

<http://singularityu.org/about/>

<http://singinst.org/overview/whatisthesingularity>

- Transhumanism, Humanity+

<http://humanityplus.org/get-involved/chapters-of-humanity/>

<http://www.detrans.de/intro/methoden.html>

- Concerns regarding Singularity

<http://www.scinexx.de/dossier-497-1.html>

<http://www.detrans.de/kommentare.html>

- David Luckham’s Complex Event Processing forecast

<http://www.citt-online.com/downloads/U-CEP.pdf>

#### 1.4 What is Simple Complex Event Processing?

- Simple CEP is the bread and butter of CEP (Opher Etzion) – today and in the near future?

- The "simple" applications are 80-90% of the potential market for the event processing technology – true?

[http://epthinking.blogspot.com/2009/12/on-common-misconceptions-about-event\\_23.html](http://epthinking.blogspot.com/2009/12/on-common-misconceptions-about-event_23.html)

- Is the event modeling of the use case in Opher Etzion’s/Peter Niblett’s EPIA book still simple?

Opher Etzion, Peter Niblett: Event Processing in Action. Manning 2010

<http://www.citt-online.com/downloads/EPIA%20for%20experts%20meeting.ppt>

- Are the examples of Mani Chandy’s/Roy Schulte’s Event Processing book simple?

K. Chandy, W. Schulte: Event Processing: Designing IT Systems for Agile Companies. McGraw-Hill 2009

- For example: Is/Was Algorithmic Trading/HighFrequencyTrading Simple CEP? From AlgoTrading

to defending against AlgoTrading

John Bates blog [http://apama.typepad.com/my\\_weblog/2010/07/defending-against-the-algo-pirates.html](http://apama.typepad.com/my_weblog/2010/07/defending-against-the-algo-pirates.html)

NANEX <http://www.nanex.net/FlashCrash/CCircleDay.html>

- What does Simple CEP mean?

David Luckham: The Power of Events: An Introduction to Complex Event Processing in Distributed Enterprise Systems. Addison-Wesley 2002

#### 1.5 What can we contribute by U-CEP and what is different?

- The concepts "Signal", "Event" and "Emergence" in different disciplines like philosophy, physics, psychology, biology, sociology and Complex Systems Science

F. David Peat: Synchronicity - The Bridge Between Matter and Mind. Bantam Doubleday Dell Publications. 1987

von Ammon, R. 2009 Event Driven Business Process Management. In Encyclopedia of Database Systems, Ling Liu and M. Tamer Özsu (Eds.), Springer

von Ammon, R., Ertlmaier, Th., Etzion, O., Kofman, A. and Paulus, Th. 2009 Integrating Complex Events for Collaborating and Dynamically Changing Business Processes, ICSOC/ServiceWave 2009, Mona+ workshop, Nov 23-24, 2009 Stockholm, Sweden, DOI= [http://www.citt-online.com/downloads/Integrating\\_Complex\\_Events\\_for\\_Collaborating\\_and\\_Dynamically\\_Changing\\_Business\\_Processes\\_MONA\\_Final.pdf](http://www.citt-online.com/downloads/Integrating_Complex_Events_for_Collaborating_and_Dynamically_Changing_Business_Processes_MONA_Final.pdf)

von Ammon, R., Ertlmaier, Th., Etzion, O. and Paulus, Th. 2009 Existing and future standards for event-driven business process management, Proceedings of the Third ACM International Conference on Distributed Event-Based Systems DEBS 2009, July Nashville, USA, DOI= <http://portal.acm.org/citation.cfm?id=1619258.1619290>

von Ammon, R. 2010 Ubiquitous Complex Event Processing

<http://www.complexevents.com/2010/05/16/ubiquitous-complex-event-processing-u-cep/>

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