Industry and Academia: Why Practioners and Researchers areDisconnected.

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Abstract

The industrial world and the academic world have grown far apart. The distance between the worlds primarily originates from different goals and different means of support. This is a problem in the areas of systems engineering and multidisciplinary design. These areas are relatively young, providing lots of opportunity for research. Education in this area is scarce. Publications are tangible examples of the gap between the two worlds.

In this paper we discuss the needs of both communities with respect to publications, education, and research. The mutual understanding of each other’s needs may help to bridge the gap between academics and industry.
Practitioners and Researchers are Disconnected
From Mono-Disciplinary to System Design

- Evolvability
- Robustness
- Cost
- Performance
- Reliability

Multi-objective design methods

Process, organization, people

Legend:
- Rather soft
- Well defined but soft
- Well defined

Mechanical Engineering
Electrical Engineering
Software Engineering

Hybrid methods
HW/SW codesign

VHDL
UML
RMA

Multi-disciplinary design
Mono-disciplinary design

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GIAmethodLayers
The Gap-Size is Multiple Orders of Magnitude

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GIAPyramid
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Industrial Criteria for Articles

- Subject
- Industrial relevance of subject
- Goal, solution oriented
- How to
- Practical
- Other contributors are reviewers
- Single author
- Clear responsibility
- Pointers to related relevant information
- Clear description
- Juicy description
- Understandable
- Lots of signal, very low noise level

Subject
- More context information
- More detailed information
- Alternative
- Valuable
- Useful
- Broad
- Integral
- Practical
- Clear responsibility

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subject
scientific relevance of subject
knowledge oriented
depth
why, what
pointers to related scientific work
all contributors are authors
new
original
more context information
competitors
used existing science
self citations are not-done
blocks broadly interested scientists in development
strong cultural filter in scientific magazines and conferences

clear argumentation
every statement is supported by reference, verifiable facts
correct language
clear positioning, well linked in with existing scientific work
Economic Viewpoint on Publications

Industry:
+ writing and reading publications is a cost
+ publications are useful for PR

Academics:
+ number of publications and citations determines standing and funding

  limits change of research area, because you have to rebuild a reputation and to bootstrap background know how
Comparing the Industrial and Academical Viewpoints

<table>
<thead>
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<th><strong>industrial</strong></th>
<th><strong>academical</strong></th>
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<td>relevance</td>
<td>useful, valuable</td>
<td>new, original</td>
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<td>orientation</td>
<td>goal, solution</td>
<td>knowledge</td>
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<tr>
<td>content</td>
<td>practical, how to</td>
<td>theoretical, why, what</td>
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<td>style</td>
<td>clear, understandable</td>
<td>clear argumentation, no loose statements</td>
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<td>juicy, low noise</td>
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<td>service to the reader</td>
<td>positioning in existing science</td>
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<tr>
<td>driver</td>
<td>public relation vs IPR and confidentiality</td>
<td>number of publications and citations</td>
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Value of publications shared by both worlds

writing facilitates overview and understanding
writing milestones help to focus on results
stops endless wandering
Different publications needed for industry and academics

some re-use via copy/paste

But how to share information between the worlds?

And how to cross fertilize, how to get inspiration from the other world?

Industry: how to outsource education to academic community?

Academics: how to enter the unknown area?
The Embedded Systems Institute (ESI) solution:
collaborative research;
seeding for long term (10-15 years) renewed respect