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

Industry and Academia: Why Practitioners and Researchers are Disconnected.
From Mono-Disciplinary to System

- process organization, people
- evolvability
- robustness
- cost
- performance
- reliability

multi-objective design methods

- performance and resource prediction
- single aspect design method
- hybrid methods
- HW/SW codesign

- well defined
- rather soft
- legend

- Mechanical Engineering
- Electrical Engineering
- Software Engineering
- VHDL
- UML
- RMA

Industry and Academia: Why Practitioners and Researchers are Disconnected. version: 0.6
March 6, 2013
Gerrit Muller
The Gap-Size is Multiple Orders of Magnitude

somewhat covered

system

gap

multi-disciplinary

well covered

Industry and Academia: Why Practitioners and Researchers are Disconnected. version: 0.6
March 6, 2013
GIApymaid
Industry and Academia: Why Practioners and Researchers are Disconnected.
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Gerrit Muller

March 6, 2013

GIAindustrialCriteria
subject
scientific relevance of subject
knowledge oriented
why, what
pointers to related scientific work
all contributors are authors
blocks broadly interested scientists in development

new
original

more context information

competitors

self citations are not-done

subject

used existing science

strong cultural filter in scientific magazines and conferences

blocks broadly interested scientists in development

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

depth
Economic Viewpoint on Publications

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

tension with Intellectual Property Rights (IPR), confidentiality

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>
<tr>
<th></th>
<th><strong>Industrial</strong></th>
<th><strong>Academical</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>relevance</strong></td>
<td>useful, valuable</td>
<td>new, original</td>
</tr>
<tr>
<td><strong>orientation</strong></td>
<td>goal, solution</td>
<td>knowledge</td>
</tr>
<tr>
<td><strong>content</strong></td>
<td>practical, how to</td>
<td>theoretical, why, what</td>
</tr>
<tr>
<td><strong>style</strong></td>
<td>clear, understandable</td>
<td>clear argumentation,</td>
</tr>
<tr>
<td></td>
<td>juicy, low noise</td>
<td>no loose statements</td>
</tr>
<tr>
<td><strong>references</strong></td>
<td>service to the reader</td>
<td>positioning in existing science</td>
</tr>
<tr>
<td><strong>author</strong></td>
<td>single author</td>
<td>all contributors as author</td>
</tr>
<tr>
<td><strong>economic driver</strong></td>
<td>writing and reading = cost</td>
<td>funding based on</td>
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<td></td>
<td>public relation vs IPR and confidentiality</td>
<td>number of publications and citations</td>
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</tbody>
</table>
writing facilitates overview and understanding
writing milestones help to focus on results
stops endless wandering
Consequences

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