Academia-to-Industry Technology Transfer: Examples and a new Infrastructure

Rainer Leupers
Software for Systems on Silicon (SSS)
RWTH Aachen University
ICE @ RWTH

- **ICE**: Institute for Communication Technologies and Embedded Systems
- **ICE team:**
  - Jointly managed by 3 professors
  - Emeritus H. Meyr
  - >30 Ph.D. students, ~12 staff
- **Focus on communication and consumer electronics design**
SSS Chair focus

- **System-level design automation and programming tools for advanced computing architectures**
- **Enablers for**
  - mobile data traffic growth
  - novel applications
  - managing design complexity
  - energy efficiency

![Graph showing petabytes/month (source: CISCO, 2011)](image)
Electronic system level (ESL) design research areas

- Compiler technologies
- HW platform exploration
- Simulation/verification
- Processor/IP block design
Current project portfolio

- UMIC Excellence Cluster
  - Ultra-high speed Mobile Information and Communication
- EU FP7 cooperation projects/networks
  - HiPEAC, DSPACE, EURETILE, TETRACOM, GEMSCLAIM
- Industry technology transfers and consulting
Example: SSS compiler technology in products

- **LANCE compiler framework**
  - C compiler for Infineon ConverGate NPU
  - Ajax High-Level Synthesis System
- **Embedded code optimization techniques**
  - SIMD instructions, predicated execution, IR emission
  - Available in ACE CoSy
- **LISA based compiler retargeting**
  - Synopsys Processor Designer
  - Enabling many other products
Some recipes for successful tech transfer

- **Build an R&D projects pipeline**
  - From basic over applied research to industry consulting
  - Some % of the basic R&D results will end up in products, others in publications
  - Not necessarily 50:50, but a good mix is generally fine

- **Build an industry network**
  - Tech transfer requires personal meetings, not only papers
  - Understand industry requirements, timelines

- **Focus your R&D on real-life problems**
  - E.g. „multicore compiler“ for a specific device instead of a generic one, generalization can follow later
  - Industry can provide focus, the visions still have to come from you
Enabling Academia-Industry Technology Transfer
TETRACOM outline

- TETRACOM: TEchnology TRAnsfer in COMputing systems
- Coordination action in EU FP7 (grant agreement no. 609491)
- Coordinator: RWTH Aachen
- Initially 8 partners, but open to the entire (European) community
Why TETRACOM?

- TETRACOM is solely focused on **academia-industry technology transfer (TT)**

**Motivation:**
- TT is not well organized at European level
- Few EU projects fully implement their exploitation plans
- Start-up companies are just one special way of TT
- Need more focus on small-scale TT

- **TETRACOM supports TT along two major activity lines**
  - TT infrastructures: workshops, consultation, WWW, social media
  - TT projects: Sponsorship of specific, bilateral TT activities

- **TETRACOM is highly experimental**
  - Will provide evaluations and recommendations for future TT instruments
Startup based TT: an example

- LISATek: Embedded processor design automation tools, developed at RWTH Aachen
  - Productized and deployed worldwide
    - LISATek Inc/GmbH startup in 2001
    - Acquired by CoWare in 2003
    - Acquired by Synopsys in 2010
- Successful TT example, but based on
  - Huge amount of previous R&D
  - Right team at right time
  - Business plan, venture capital
  - Some good luck, too

=> Most of our TT would not have worked this way!
Technology transfer projects (TTPs)

- TETRACOM’s major new instrument
- TTP model:
  - Bilateral project between a university partner U and a company partner C
  - Typical duration: 3-12 months
  - C intends to purchase or license a particular existing technology (e.g. a SW tool or a HW IP block) from U, normally along with some services (porting, training, …)
- TETRACOM provides partial funding
Technology transfer infrastructures (TTIs)

- **Semi-annual workshops with TT experts**
  - Often co-located with HiPEAC events
  - See e.g. TISU 2014, DATE 2014
  - Contact: Koen Bertels, TU Delft

- **TT consultation service**
  - Organization or provision of individual TT consultation (e.g. about practical or legal aspects)
  - Contact: Wayne Luk, Imperial College

- **Web site:**
  - [www.tetracom.eu](http://www.tetracom.eu)
  - Up-to-date announcements, project calls, TT broker, …
  - Contact: Luca Fanucci, Uni Pisa

- **Community information**
  - Monthly newsletter
  - Social media channels: LinkedIn, twitter, facebook, …
  - Contact: Koen de Bosschere, Uni Ghent
How to obtain TETRACOM TTP funding?

- Will issue 3 open calls for TTP proposals (first call: Feb 2014)
- Lightweight proposal scheme, only 3 pages
- Academic TTP partners apply, supported by company partner
- Proposal eligibility:
  - Academic TTP partner is located in EU
  - Company partner has business activities in EU
  - Company partner by default at least contributes 50% of total project budget (typically 10k-200k EUR)
  - Expected average TETRACOM contribution: 25k EUR
  - A bilateral contract between academic and company partner exists
- Competitive process involving external evaluators operating under NDA
- Fast turnaround times (few weeks until „go/no go“)
- In case of TTP proposal acceptance, academic TTP partner joins the TETRACOM consortium as „guest partner“ to obtain funding
  - Receives, spends, reports like in ordinary FP7 projects
TTP proposal selection criteria

1. **Impact (1 page)**
   - To what extent will the proposed TTP lead to added value according to several economic and academic criteria?

2. **Soundness of concept (1 page)**
   - Are the proposed TTP concept and its associated work plan realistic within the given budget and time frame?

3. **Quality of the university/company partner combination (0.5 pages)**
   - Is it likely that the proposed combination will succeed in its TT goals, given the academic and business profiles of the two partners?

4. **Resources (0.5 pages)**
   - Are the proposed resources sufficient and well justified altogether? Is the company partner’s contribution sufficiently significant to substantiate his interest in the proposed TTP?

   - **Detailed submission and selection rules as well as proposal templates will be made available with TTP proposal calls**
What’s next?

- First TTI’s have been scheduled (e.g. DATE 2014)
- First TTP call planned for Feb 2014 with a total budget of 300k EUR
- Detailed information will follow via WWW, newsletters etc.
- TETRACOM aims at supporting around 50 TTPs in total
- Please contact the coordinator at leupers@ice.rwth-aachen.de in case of any questions
- Only YOUR participation can make TETRACOM a true success!

Thank you!