

Road to Top Conference(s) (I'm still on the way to the next.)

Hirochika Asai (Univ. of Tokyo)

CJK (China/Japan/Korea) Workshop on How to do Research for Young
Researchers/Students

CFI 2016 @Nanjing, China

June 15, 2016

Who am I?

- Hirochika Asai

- 2013 Received Ph.D. degree from Univ. of Tokyo (Information Science and Technology)
- 2013– Project Assistant Professor at Univ. of Tokyo
- 2014– Board member of WIDE Project

- Research Interests

- Operating Systems
- Distributed System and Data Communication Network Architecture
- Internet Operations and Management

Today's Talk

- Case Study
 - Background story (history) of our SIGCOMM 2015 paper
 - Hirochika Asai and Yasuhiro Ohara, "Poptrie: A Compressed Trie with Population Count for Fast and Scalable Software IP Routing Table Lookup," ACM SIGCOMM 2015
- Three messages from my case
 1. Have fun
 2. Find good colleagues
 3. Let's try

Background Story of Our SIGCOMM 2015 Paper

- 2013-07 Come up with the basic idea of Poptrie
- 2014-11 Implemented a proof-of-concept code
 - Trial and error to understand my proposal
- 2014-04 Presented in a (closed) research meeting
 - High-speed PC router research group
 - Get comments from professionals
- 2014-06 Submitted to CoNEXT 2014
- 2014-09 Rejected
- 2015-01 Submitted to SIGCOMM 2015
- 2015-04 Accepted
- 2015-08 Presented

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- 2014-04 A challenge on software-based routers: Routing table lookup
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 - DRAM is too slow to traverse a tree (trie) data structure at a fast rate
- 2015-04 Accepted
 - Can we keep it within a fast memory (i.e., CPU cache)?
- 2015-08 Presented

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 - consuming much memory
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 - Some compression techniques
 - consuming computing steps
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- 2015-04 Found “popcnt” instruction in x86 developers’ manual
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These ideas had come from knowledge on operating systems.

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 - Low-layer (e.g., OS, FPGA) geeks from WIDE project
 - Good place to discuss non-published (even immature) ideas
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- Premise: It was a single author paper.
- My co-author (in future at the moment) said
- “You MUST challenge SIGCOMM if it is rejected.”
- It’s like a fantasy but a true story.

Review Comments from CoNEXT 2014 TPCs

- Presentation issue
 - “Overall the paper is difficult to follow. I am not sure I would be able to reproduce this algorithm correctly from the description.”
- Proposed method
 - “The biggest weakness is the lack of description for updatability.”
- Evaluation
 - “Another weakness is that there could be more evaluation.”

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 - We, my co-author Yasu-san and I, had closely worked with each other
 - For example, against the presentation issue
 - Clarify the description until he can reproduce the algorithm
- 2014-06 Emphasize the precise evaluation with my single task OS
- 2014-09 Rejected
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Took 2+ years to publication

Three messages from my case

1. Have fun
2. Find good colleagues
3. Let's try.

1. Have fun (by two reasons)

- To accomplish your work along with long and hard road to top conferences
 - You cannot pursue what you are not interested in.
 - In my case, it took more than 2 years.
- To devise novel methods and conduct good research
 - I recommend you to have the your own project you are really interested in
 - although your theme might be
 - given by your supervisor
 - proposed by yourself (it's ok)
 - In my case, the idea and evaluation largely rely on my operating system work.

2. Find good colleagues

- To figure out challenges and get more practical comments in your research area
 - You cannot know everything, but somebody else may know what you don't know.
 - In my case, the challenge to routing table explosion was explained by IETFers.
- To improve the presentation of your paper
 - You know your work far too much to find poorness in your paper.
 - (I'm trying a single-author paper again. It's too bad if I were "Dr. Jekyll & Mr. Hyde"... I'm seeking a good collaborator.)

3. Let's try.

- Implement the cycle of trial and error
 - No shortcut path exists.
 - So many trials behind a paper.
- Aim at top conferences
 - I don't know I could do this in my Ph.D. course if I was advised so, but I recommend you to aim at top conferences.
 - Other benefits of the submission to top conference
 - Get good comments from reviewers
 - Strengthen your motivation

Summary

- Have fun
 - You cannot pursue what you are not interested in.
- Find good colleagues
 - to extend your view (for challenges and your presentation)
- Let's try!
 - Submit your work to top conferences
 - Do it yourself if you have any questions on something
 - Implement the cycle of trial and error