

Foreword about the New ISCA Industry Track

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The origins of this track go to ISCA 2019, when I complained over dinner about the lack of papers on real industrial products appearing at ISCA¹. Sarita Adve was at the table, and as SIGARCH chair she didn't take the complaint lightly. With the blessing of the ISCA 2020 steering committee and Program Chair Lieven Eeckhout, Sarita assigned me to help to fix the problem for 2020, resulting in the institution of the ISCA Industry Track. We all agreed that product papers comprising the ISCA Industry Track should be less than 10% of the overall ISCA papers.

I thought the only hope was a separate submission process with a separate program committee (PC) whose members believed that retrospective papers on industrial products were valuable complements to academic research papers. Our PC is a mix junior and senior people from industry and academia who did a lot of work in a short time:

Carole-Jean Wu	<i>Arizona State and Facebook</i>	Mark Hill	<i>Wisconsin</i>
Caroline Trippel	<i>Stanford</i>	Olivier Temam	<i>DeepMind and Inria</i>
Chris Hughes	<i>Intel</i>	Sophia Shao	<i>UC Berkeley</i>
Joel Emer	<i>MIT and NVIDIA</i>	Yuan Xie	<i>Alibaba and UCSB</i>

As industry papers need to be approved by management before submission (often involving multiple rounds of redaction), and there can be restrictions about filing patents before submitting a paper, we set the paper deadline to January 20, 2020—about two months after the ISCA deadline—to improve the chances of receiving such papers.

We thought that we needed to encourage papers for this first track. We held our recruiting meeting on November 26, 2019, and reached out to 9 companies. After talking to them, we pushed the paper deadline back 10 days.

We received 19 papers on January 30, three of which we recruited. The competition was stiff, with the majority of papers being strong. PC members who were also on the regular ISCA PC found that the industry papers were very engaging and brought interesting perspectives with different values than the typical ISCA submission.

We did two rounds of reviews, adding 1 or 2 external expert reviewers to 3 reviews by PC members in the first round. Every unconflicted PC member familiar with the topic reviewed the final 10 papers of the second round; the average was 9 reviews per paper, and 11 papers per PC member. We barely had time to get authors' responses to these reviews before our meeting on February 20, where we discussed each paper for about 15 minutes. We informed the authors of the outcome on February 22. Here are the 5 accepts, of which only one was recruited:

- “Data Compression Accelerator on IBM POWER9 and z15 Processors,” *IBM*
- “High-Performance Deep-Learning Coprocessor Integrated into x86 SoC with Server-Class CPUs,” *Centaur*
- “The IBM z15 High Frequency Mainframe Branch Predictor,” *IBM*
- “Evolution of the Samsung Exynos CPU Microarchitecture,” *Samsung*
- “Xuantie-910: A Commercial Multi-core 12-stage Pipeline Out-of-order 64-bit High Performance RISC-V Processor with Vector Extension,” *Alibaba*

These papers are labelled “**Industrial Product**”, and we're delighted they are in the honored first session of ISCA.

Academics interested in these topics should read these papers to get a better understanding of the important issues that arise when deploying designs in the real world. We suspect that none of the selected papers would have survived the traditional ISCA process, as reviewers would expect different content and evaluations.

These 5 papers are all focussed on chips and microarchitecture, narrower than we hoped. Given the limit by the steering committee of at most 5 papers, and the quality of the papers submitted, after extensive discussion we settled on these 5. We would have accepted 7 or more papers if we had been given a higher target; the likely next 2 focussed on warehouse scale computing, which would have helped to diversify the topics.

As a result of having such high quality submissions, we contacted the *IEEE Micro* editor-in-chief Lizy John. She was excited to publish the good papers from industry that we couldn't accept, so November 2020 will see a special issue of *IEEE Micro* on commercial products. We invited 6 industry track papers to resubmit to the special issue, which, when added to the 5 accepted papers, indicates the overall strength of the 19 original submissions. We accepted 5/19 or 26%, while the regular ISCA PC accepted 77/428 or 18%.

We finalized a strong program for the first ISCA Industry session only 3 weeks after the papers arrived, a tight schedule. If we do it again, we recommend earlier dates for the recruiting meeting (August), an earlier paper deadline (\approx 1/11/21) to give the PC more time, a little larger PC (\approx 12) to cope with the likely more submissions, and a larger target than 5 papers, which represent only 6% of the total number of papers in 2020.

¹ The blog www.sigarch.org/publication-trends-at-isca/ confirmed my view. Industry papers fell from 40% in the 1970s to 10% today, and even that 10% includes papers based on industrial research rather than industrial products.