

# COMMENTS OF 2016 ON YURI GUREVICH'S PAPER “LOGIC ACTIVITIES IN EUROPE” OF 1994

Joost-Pieter Katoen and Wolfgang Thomas  
RWTH Aachen University

katoen@cs.rwth-aachen.de, thomas@cs.rwth-aachen.de

## Prologue

In his noteworthy paper on “Logic Activities in Europe” of 1994, Yuri Gurevich focussed on logic in relation to computer science. Following comments on “the incredible breadth of European foundational research” (in his Section 3.4), he addressed concrete programs and frameworks of research in rather short Sections 3.5–3.7 (with less than a page altogether), titled “ESPRIT”, “Conference centers”, and “Disparate remarks”. Here he discussed the efforts of the European Community to “overcome the fragmentation of the European research by countries”, he points to the research centers of Dagstuhl, Luminy, and Udine, and he mentions “strong, unifying, and active organizations” (EATCS, EACSL, and FoLLI). All this conveys a sense of appreciation of the European situation and European efforts.

In this note we try an update of these sections of Yuri’s paper twenty years later, following an invitation of Luca Aceto, president of the EATCS. It is perhaps surprising that Yuri’s main observations match quite well what can be said also today. In our comments we summarize the development since 1994, and we add two sections, on the landscape of conferences, workshops, and research schools, and on academic publishing in our domain.

## European research funding

Starting with the ESPRIT program (European Strategic Program for Research and Development in Information Technology) that was launched in 1983, several frameworks opened possibilities to obtain funding (up to Framework Programs FP8 that started in 2014, also known as Horizon 2020). From ESPRIT in 1995 to Horizon 2020 there is a great leap both in scope and amount of funding. There

were and are complaints about the bureaucracy involved in EU projects, but it is fair to say that the European funding contributed a lot to create a landscape of research which as a whole is now more European than the sum of the national research efforts. An important aspect is the increased exchange of researchers by the funding of PhD student and postdoc positions that were and are built into European research projects as well as facilitated by the Marie Curie program. This led to an integration of European research far beyond the level in 1994, both regarding integration across countries and across disciplines.

It will be interesting to see how the significantly increased focus of H2020 on applications and industrial exploitation will affect this situation. Whereas up to FP7 participation of industrial partners was mostly restricted to case study providers, H2020 requires a much more prominent role of industry in the projects. In addition, the exploitation of project results (in terms of spin-offs and industrial adoption of project results) has become a major evaluation criterion. There is not much room for theory-oriented research. As a result, the only more research-oriented sub-programs such as FET-OPEN had acceptance rates of below 5% in 2015. When this trend continues, we fear that the importance of the Framework Programs for fundamental science may be at risk.

The EU-frameworks were complemented by the European Science Foundation (ESF) which offered funding through national funding agencies. With some regret we realize that many programs of ESF terminated. The administrative overhead was smaller (as perceived from the scientists), and it seems that some competition between different funding lines is healthy.

A remarkable new development started in 2007 with the ERC (European Research Council) grants. They are complementary to the classical EU funding schemes in the sense that merits of individuals are acknowledged and their projects supported. The ERC grants are respected today as top awards, matching well the highest awards of the EU countries. By the end of 2014 more than 600 ERC projects were finalized.

## **European workshops and conferences, and research schools**

In 1994, the main conferences in Europe in theoretical computer science (ICALP, STACS, MFCS, FCT) were already well established, and the division into “Western” (ICALP and STACS) and “Eastern” (MFCS and FCT) conferences had become largely obsolete. With a definite focus on logic there were, for example, CSL (founded 1987) and CONCUR (founded in 1990). In 1999, ICALP was structured into Track A (for algorithms and complexity) and Track B (for formal

methods and semantics); later a Track C was added to deal with varying subjects of special interest. As with all such divisions, problems arose in the “grey zones”; for example, automata were first put into Track A and later in Track B. On a more international level, one should mention LICS (Logic in Computer Science, which is considered the leading conference in logic related to computer science) and CAV (Computer-Aided Verification); both of them are held in Europe around every third year.

A major breakthrough in creating a European venue of “logic” (in a broad sense, and with a focus on computer science and programming in particular) was the establishment of ETAPS (European Joint Conference on Theory and Practice of Software) in 1998. It started as a multiconference bundling the five conferences FoSSaCS (Foundations of Software Science and Computation Structures), ESOP (European Symposium on Programming), FASE (Fundamental Aspects of Software Engineering), TACAS (Tools and Algorithms for the Construction and Analysis of Systems, that originally started as the European version of CAV), and CC (Compiler Construction); in 2011 a sixth conference POST (Principles of Security and Trust) was added. CC left ETAPS in 2016. ETAPS serves now as the main meeting point in the area of formal methods in Europe; usually about a dozen of workshops is associated to an ETAPS edition, and the conference receives 600–700 submissions annually.

Besides this, many more conferences and workshops were created that helped to define a European culture of research, probably with a density and vivid exchange between researchers that is not seen anywhere else in the world. Any list given at this point will be incomplete; let us just mention FM, RTA and TLCA (now joined to FSCD), CALCO, ICDT as some examples. For an illustration of the rich list of workshops with high quality, it may suffice to refer to the proceedings published with EPTCS (Electronic Proceedings in Theoretical Computer Science, discussed in more detail below), where many items can be associated to “logic” and many are held in conjunction with European conferences or at European locations.

A last aspect should not be forgotten: In various frameworks the work of young researchers is supported by research schools (often called spring school, summer school, etc.). They are most important to get young people together, to have a lively exchange between young and “established” researchers (the docents), and to foster cooperation in Europe and world-wide. The FoLLI schools (of the Federation of Logic, Language, and Information) and the Marktoberdorf summer schools (in particular the “blue series” devoted to logic) are master examples. The significance of these events is acknowledged by EATCS; since 2014 there is an annual EATCS summer school for young researchers.

## Research centers

Since its foundation in 1990, Schloss Dagstuhl (Saarland, Germany) has developed into a leading address for small meetings in top-level research; every week one or two seminars are held in various domains of computer science. Much progress in logic, semantics, verification, and formal methods was greatly supported (sometimes even made possible) by these seminars. From time to time “perspectives workshops” are held on long-term challenges, interdisciplinary cooperation, etc. There does not seem to be any other place in the world matching this profile. The formal status of Dagstuhl was strengthened (beyond a locally funded institute) by inclusion in the “Leibniz-Gemeinschaft”, in which institutions of nation-wide significance are funded by the German federal ministry of research. In Italy, Bertinoro was established as a similar center (however covering many other subjects besides computer science). It is interesting to note that these centers of (at least) European relevance are just funded with national money. The successful Dagstuhl concept has given rise to similar initiatives both within Europe (the already mentioned Bertinoro and the Lorentz Center in the Netherlands) as well as outside Europe such as NII Shonan (in Japan) and Mysore (in India) whose scope as Bertinoro goes beyond computer science.

## Developments in academic publishing

The ever increasing prices for published research and the commercialization of publishing (in stock-market companies, such as Elsevier, and enterprises held by private equity firms, such as Springer) led to activities in the scientific community to start alternative models of publication, aiming at open access at small fees. Back in 1994, this development was visible only in its nucleus. The open access platform arXiv had been founded in 1991 and from 1999 was hosted at Cornell University, giving it a firm perspective. In France, the open access archive HAL (Hyper Articles en Ligne) has been launched in 2011.

The community of logic in computer science was active and successful in opening non-commercial high-level journals in their domain. The first was ACM Transactions on Computational Logic, founded in 2000 with Krzysztof Apt as first editor-in-chief, the second was Logical Methods in Computer Science, founded in 2005 with Jiri Adamek as editor-in-chief, who also cared for the enormous work of hosting the journal (as an overlay of arXiv) at the Technical University of Braunschweig. These efforts (jointly by many people and institutions, not just in Europe) significantly changed the infrastructure conditions in which our research takes place. It is worth to mention that both journals have rapidly obtained a very good status among the traditional journals in logic.

On the level of conference proceedings, the “classical venue” back in 1994 was Springer LNCS. Reacting to price increases that prohibited many libraries to order these proceedings, alternative publication venues were founded. First we mention LIPIcs (Leibniz International Proceedings in Informatics) for high-quality conferences, founded in 2008 as a joint project of STACS, FSTTCS (Foundations of Software Technology and Theoretical Computer Science, an India-based top-level conference), and Dagstuhl. Secondly there is EPTCS (Electronic Proceedings in Theoretical Computer Science) for high-level workshops, started in the same year by Rob van Glabbeek. The conferences ICALP and ETAPS stayed with LNCS (in the newly created subseries ARCoSS, whose editors-in-chief were simultaneously president of EATCS and chair of the ETAPS steering committee, respectively), but various logic-related conferences (among them CSL and CONCUR) joined LIPIcs. In 2015 ICALP followed. In the present rapid development the perspectives are quite open, but already the fact that there is now competition between commercial and non-commercial publication models is an improvement of the situation, regarding the main purpose of publication, namely the (affordable) exchange of scientific ideas and results.

## Associations

As mentioned by Yuri Gurevich in 1994, EATCS was then active and strong as a scientific association in theoretical computer science. Today one can say that this European institution in fact serves as the representation world-wide in this domain. In the (sub-) domain of logic, EACSL (European Association of Computer Science Logic) has established itself as another strong and visible reference point. In the field of formal systems development, FME (Formal Methods Europe) is rather active and amongst others responsible for the FM symposium. Many awards and prizes have been established to acknowledge excellent contributions; as examples we mention the Presburger Award (by EATCS, for young researchers) and the Ackermann Award (by EACSL, for dissertations in the area of logic in computer science), both named after logicians. On a more advanced level, SIGLOG, mentioned below, launched the Alonzo Church Award for Outstanding Contributions to Logic and Computation in cooperation with EATCS, EACSL, and the Kurt Gödel Society.

Summing up, logic in computer science continues to have a very strong representation in Europe. It looks stronger than in the U.S. where algorithms and complexity theory still seem to enjoy higher estimation. The foundation of ACM SIGLOG (Special Interest Group on Logic and Computation, established in 2014) may change this; here we have a venue of logic in computer science which is visible and appreciated world-wide. It should also be useful in connecting research

in Europe and the U.S. with that of many Asian countries in which the last twenty years have seen a considerable increase of research activities in logic related to computer science.