PETER SCHROEDER-HEISTER

Kosta Došen
(1954-2017)

Kosta Došen died on the 21st of October 2017 in Belgrade, Serbia. Born in Belgrade on the 5th of June 1954, he graduated from the University of Belgrade in 1977 and received his doctorate from the University of Oxford in 1981. From 1982 onwards he was assistant professor, from 1995 full research professor at the Mathematical Institute Belgrade. He was full professor at the Department of Computer Science of the University of Toulouse (France) from 1994 to 1998, and from 2003 until his death he held the Chair of Logic in the Philosophical Faculty of the University of Belgrade. He had visiting professorships at universities including Notre Dame (USA), Montpellier (France) and Tübingen (Germany).

Kosta Došen's DPhil on *Logical Constants* [3] was supervised by Michael Dummett and Dana Scott. As part of his thesis, and in subsequent publications, he developed a proof-theoretic characterization of logical constants as 'punctuation marks' by means of what he called 'double-line rules'. This continues to be widely discussed and is one of the major approaches in the debate on what logicality should mean. In the 1980s he also published a number of articles on Kripke semantics of plain and modal intuitionistic logic. Working on the proof theory (and partly also model theory) of logics with restricted structural rules, he coined the term 'substructural logic' at a conference in Tübingen in 1990, which, together with its proceedings of 1993 [7] led to a rapid development of the subject, establishing it as a well-recognised field within the logic community.

However, the main topic of his intellectual life was categorial proof theory which was founded by Jim Lambek, William Lawvere and others. Kosta Došen shaped the development of this field in many respects, in particular with his books *Cut Elimination in Categories* [4] and *Proof-Theoretical Coherence* [6] (the latter with Zoran Petrić). The first book demonstrates

that many methods of proof theory, in particular cut elimination, have a categorial counterpart (called 'cut disintegration') with direct applications in the categorial framework. Even more importantly, it shows that categorial concepts such as functor, adjunction and comonad can be better understood when the idea of cut disintegration is taken into account. The second book studies a variety of logical categories and proves that they can be viewed as subcategories of a properly understood Boolean category, that is, of a 'categorification' of the notion of a Boolean algebra.

Kosta Došen was a strong adherent and promotor of what Dag Prawitz called 'general proof theory', which is the study of proofs as objects in their own right rather than from the point of view of provability. This implied for him that the question of the identity of proofs was the central topic of general proof theory, where he was particularly interested in the relationship between normalization-based and generality-based approaches. In fact, his work on coherence can be viewed as an elaboration of his claims on identity of proofs, since categorial proof theory provided him with the proper framework to deal with this problem. Kosta Došen agreed that hypothetical judgements should be considered primary to categorical judgements ('categorical' in the sense of traditional theory of judgements, not in the sense of modern category theory), and that, when proofs are made explicit by means of terms, the proper notation for a hypothetical judgement leading from A to B would be something like '$f : (A \vdash B)$', which corresponds to an arrow in categorial logic, rather than '$x : A \vdash t(x) : B$' as is standard in the Curry-Howard approach.

In recent years he worked with great passion on Kurt Gödel's work, including unpublished manuscripts in Gödel's Nachlass. A critical edition (with Miloš Adžić) of Gödel's Notre Dame course in logic [2], meticulously carried out, appeared a few weeks before his death.

Kosta Došen was a highly educated person far beyond his (multiple!) fields of research. His knowledge and spectrum of interests reached from politics and history to art and medicine. Touching a point of modern political history could start a conversation of several hours while meandering the streets of Belgrade. He was also an inspiring teacher. Students are full of praise for the way he explained things and elicited their interest even in the driest of topics if he was convinced of their significance. His elementary textbook on logic [5] in Serbian shall continue to guide students of the field.

Kosta will be greatly missed by family, friends, and colleagues, and all who had the good fortune to know him.

A detailed *Curriculum Vitae* provided by Kosta Došen himself, as well as a photograph, can be found in [1].

References

[1] Adžić, Miloš, (ed.) *Kosta Došen, 1954-2017. Detailed Curriculum Vitae*, 2018. https://dx.doi.org/10.15496/publikation-23600.

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[3] Došen, Kosta, *Logical Constants: An Essay in Proof Theory*, Ph.D. thesis, University of Oxford, 1980.

[4] Došen, Kosta, *Cut Elimination in Categories*, vol. 6 of *Trends in Logic*, Kluwer, Dordrecht, 1999.

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