



Citation for published version:

Power, J & Wingfield, C 2014, 'Preface', *Electronic Notes in Theoretical Computer Science*, vol. 303, pp. 1-2.
<https://doi.org/10.1016/j.entcs.2014.02.001>

DOI:

[10.1016/j.entcs.2014.02.001](https://doi.org/10.1016/j.entcs.2014.02.001)

Publication date:

2014

Document Version

Peer reviewed version

[Link to publication](#)

University of Bath

Alternative formats

If you require this document in an alternative format, please contact:
openaccess@bath.ac.uk

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Electronic Notes in Theoretical Computer Science

20th WESSEX THEORY SEMINAR:
WORKSHOP ON ALGEBRA,
COALGEBRA AND TOPOLOGY

Bath, United Kingdom

March 1 2013

Guest Editors:

JOHN POWER AND CAI WINGFIELD

Contents

Preface	v
SEBASTIAN KERKHOFF, REINHARD PÖSCHEL AND FRIEDRICH MARTIN SCHNEIDER A short introduction to clones	1
SEBASTIAN KERKHOFF Dualizing clones as models of Lawvere theories	14
MIKE BEHRISCH Clones with nullary operations	39
MARTIN HYLAND Towards a notion of lambda monoid	70
SAM STATON Freyd categories are enriched Lawvere theories	88
EKATERINA KOMENDANTSKAYA, MARTIN SCHMIDT AND JÓNATHAN HERAS Exploiting parallelism in coalgebraic logic programming	97
CLAUDIO HERMIDA, UDAY S. REDDY AND EDMUND P. ROBINSON Logical relations and parametricity - a Reynolds programme for category theory and programming languages	124
FRIEDRICH MARTIN SCHNEIDER Chaotic actions of locally compact Hausdorff topological groups	154
CYNTHIA VERA GLODEANU Exploring users' preferences in a fuzzy setting	169

Preface

Category theory and universal algebra have been closely related since Bill Lawvere wrote his Columbia PhD thesis in 1963. In his thesis, Lawvere abstracted the universal algebraic notion of clone. Universal algebraists in turn characterised Lawvere theories as abstract clones. More recently, category theorists have developed coalgebra, while universal algebraists have developed coclones. Both category theory and universal algebra have been applied to topology.

In 2013, the Royal Society awarded the University of Bath, with its specialism in category theory, and the Technical University of Dresden, with its specialism in universal algebra, a travel grant to develop the relationship between the two bodies of work. The centre point of the interaction was a workshop held in Bath on 1 March 2013, on Algebra, Coalgebra and Topology. The workshop fitted into the Wessex Theory Seminar series, acting as the 20th such seminar. There were nine speakers and a total of 54 participants, a few of them by video-link. Several participants came from continental Europe, specifically from France, Germany and Italy. This is the proceedings of the workshop.

The focus of the workshop was on the Pol-Inv Galois connection between relational algebras and clones, the first three talks being devoted to it. So we start the proceedings with a brief overview of Pol-Inv in universal algebraic terms. Category theoretic techniques are central to the notion of coclone, which in turn has universal algebraic application, so we follow with an article on that.

One of the key bones of contention over several decades between category theorists and universal algebraists has been the role of nullary operations. Nullary operations are central to the body of work surrounding Lawvere theories but have traditionally not appeared in the universal algebraic literature. We proceed with an article that details exactly how the Pol-Inv Galois connection may be modified to allow for nullary operations, thus opening the way to a category theoretic treatment of the connection in terms of Lawvere theories.

After lunch, the workshop turned from Pol-Inv to category theoretic approaches to algebra and coalgebra. A substantial and growing application is to logic programming: a clash of commitments could not allow that to be presented at the meeting itself, but as it was intended, we include an article on it. We end the proceedings with further applications of algebra represented by participants at the meeting.

We are grateful to ENTCS for their support, and in particular to Mike Mislove, Managing Editor of the ENTCS series.

Bath, 2013

John Power and Cai Wingfield