



Correctly implementing traditional software or hardware is already a difficult and error-prone task. Additional and unique challenges arise when implementing a molecular device or engineered biological system. For example, direct observation of these systems is not generally possible. Since the goal of many such systems is to operate within living cells, safety and correctness are of paramount concern. There is, therefore, great potential for the application of formal methods and automated verification in their rational design, in order to ensure that they are safe and robust. It is our belief that formal verification, within the broader setting of computer aided design tools, needs to take on a larger role in these application areas. Verification researchers have the potential to make significant contributions and help grow these fields in new directions. With the aim to expose verification researchers to the pertinent problems, and unique challenges, found in the domain of engineered biological systems, the first workshop on *Verification of Engineered Molecular Devices and Programs (VEMDP 2014)* was held on July 17, 2014. The workshop was affiliated with the *Computer Aided Verification* conference (CAV 2014) and was part of the larger *Vienna Summer of Logic*.

The workshop included keynote talks by Luca Cardelli (Microsoft Research) on morphisms in chemical reaction networks, Masami Hagiya (University of Tokyo) on computation with molecular robots, and a tutorial by Andrew Phillips (Microsoft Research) on computational design of DNA strand displacement systems. Four refereed contributed papers were accepted for publication in the workshop proceedings and oral presentation. These papers cover topics on chemical reaction networks, DNA strand displacement systems, and genetic circuits. Four oral presentations were contributed covering modelling and experimental implementations of well-mixed and spatially organized chemical reaction networks, and modelling of naturally occurring and synthetic biological systems. In addition, four posters and two demos were presented on related topics.

We thank the program committee for their invaluable feedback and suggestions in setting a program for this first of its kind workshop. Their expertise has ensured the high quality of contributed and invited presentations.

Vienna, July 2014

Marta Kwiatkowska, Andrew Phillips, Chris Thachuk

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