

Tomorrow's Mathematicians Today Conference Report

On Saturday 11th February 2017 the 6th edition of the Tomorrow's Mathematicians Today conference series, initiated in 2010 by Noel-Ann Bradshaw of the University of Greenwich, was hosted by Manchester Metropolitan University at its Business School. The event was based on the theme of "Mathematical Software Applications" and it was organized by the university's School of Computing, Mathematics and Digital Technology in conjunction with the Institute of Mathematics and its Applications, represented on the day by Erica Tyson. Several companies also kindly sponsored the event, GCHQ, who supplied the prize for the best paper, Maplesoft, Mathworks, and Wolfram.

Participants attended from universities across the whole of the UK and the GCHQ best paper prize was awarded to Jamie Graves from Manchester Metropolitan University for his paper "Computational Techniques for Sparse Matrices." Second prize was awarded to Martin Chak from Imperial College, London for his paper "Models of Neurons" and copies of all submitted papers can be found at the conference website, <http://www.scmdt.mmu.ac.uk/tmt2017/>

All students were warmly thanked for their contributions and the day was an excellent opportunity to showcase the use of mathematical software in a wide range of applications.

Surak Perera from Maplesoft explained that symbolic computing is technology that allows one to formulate and solve mathematical problems analytically. The techniques that have been developed from this area of research over the past 30 years are now being applied to solve challenging problems in the modern world, including applications in clean energy, automation, robotics and spacecraft systems. His demonstration involved the mathematical modelling and simulation of a BB8 droid robot, a double pendulum and a wave pendulum system using the MapleSim modelling environment. Symbolics allows one to extract the mathematical structures from the system schematic, interrogate them and simplify without any losses in accuracy in the result.

Jasmina Lazic from MathWorks demonstrated how MATLAB can be used to implement and apply mathematical methods for solving some of the common problems in modern industry, including medical imaging, social media analytics and real-time object recognition. Jasmina described how mathematical models and technology can bring value to companies, using the examples of shelves stacking in a supermarket and personalising car insurance premiums. The aim of the talk was to bring to life how mathematics is used to improve our lives and society, thus depicting a career in mathematics as a compelling and rewarding choice.

Jon McLoone from Wolfram explained the design philosophy behind Mathematica and the Wolfram Language. He argued that creating a productive computation system that allows mathematicians to apply their mathematical knowledge in the widest range of settings required a focus integration and automation. He gave examples of how rejecting the extension through toolboxes model, and instead integrating of the widest range of computation into one language allowed problems to be easily solved with cross-domain approaches. He also gave examples of the way that automatic algorithm selection made it possible to perform sophisticated computations with minimal specific knowledge of the algorithms and to ease the entire workflow from import, to computation, to interface building and final deployment on the web. Finally he claimed that delivery of these design aims was enabled by the fundamental use of symbolic computation beyond simply computer algebra applications.

The day concluded with a keynote talk by Dr Stephen Lynch from Manchester Metropolitan University entitled "Using Technology in Mathematics to Enhance Teaching, Learning, Assessment, Research and Employability." Stephen has had an extensive career promoting the benefits of mathematical software to real world applications and his talk was an excellent finale to a highly enjoyable day. The next TMT conference will be hosted by the University of York in 2018, to whom we wish the very best of success.

Dr Norman Ellis, Head of Division of Mathematics and Computation, Manchester Metropolitan University