The ACM A.M. Turing Centenary Celebration

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2012 is a noteworthy year in the relatively short history of computing science. It was 100 years ago on the 23rd of June 1912 that the British computing scientist Alan Mathison Turing was born; the man widely credited as the father of computing science. Among many achievements, it was his influential work developing and formalising the early models of computation - the eponymous Turing Machine, which played a major role in the development of early computers. Even a visionary such as Turing could probably never have imagined the impact that his work would have in laying the foundations of a computer age.

To mark the centenary of Alan Turings birth, the ACM organized a two day celebration in downtown San Francisco. Central to the event were the prestigious ACM A.M. Turing Award winners, 33 of whom attended to give talks and participate in panels drawing on diverse aspects of computing science both past, present and future. It was with great pleasure that I was given the opportunity to attend the Turing Centenary Celebration as a Student Scholar. So, it was on a typically brisk and foggy Friday morning in San Francisco that I entered the auditorium in the Palace Hotel. It was packed to the rafters with around 1,000 attendees from across the world, eager to hear the thoughts and opinions of some the most influential industrial and academic researchers of our discipline. Although there were a wide variety of subjects covered during the event, I have attempted to summarize the areas of most interest to the IR community, in addition to some of the more general recurring themes over the two days.

Proceedings got underway with a panel on Turing the Man, moderated by Keith van Rijsbergen. Most readers from our community will be familiar with Keiths seminal work on the principles of IR. Perhaps less well-known is Keiths past study on the life and work of Turing. In particular, Keith wrote an article in 1985 named Turing and the origins of digital computers which tells the fascinating story of Turings efforts [1].

Turings life began modestly, growing up in the counties south of London. His early signs of intellectual genius were accompanied by a talent for sport. After completing an undergraduate degree at Kings College in Cambridge, Turing began investigating the mathematical problems of computation. It was during this time that he developed the abstract models that were to later become the Universal Turing Machine, providing a method of generalizable computation. At the outbreak of the Second World War, Turing was invited to work on German code-breaking at Bletchley Park. The complex combinatorial problems this vital work uncovered necessitated engineering of early electromechanical machines, which served as precursors to modern computers. Despite his success, and arguably shortening the War by two years, Turing never received recognition due to secrecy. At the age of 41, Turing committed suicide by eating an apple laced with cyanide, following chemical sterilization by the British Government for being a homosexual. Computing science undoubtedly lost a great mind, it is impossible to know what Turing may have achieved had he continued his work.

The quest for machine intelligence and consciousness were also the subject of a panel, with further discussion later permeating through related talks as the concept draws on so many other areas of research. One of the grand challenges in computing science is to build a conscious computer which can pass the ultimate reality evaluation, proposed by Turing in 1950. The Turing test examines if a human is unable to distinguish a machines responses from another human. Unfortunately, were not there just yet. But, IR research plays a central role in the development of this field. Intelligence requires knowledge. In particularly, methods and tools for structuring, storing, retrieving and understanding information provided by our field are already making their way into the frontiers of this work, exemplified by industrially successful systems such as IBM Watson and Apples Siri. Can machines think though? The debate of whether a computer is capable of elegantly spontaneous thought rages on.

At the age of 26, I can proudly claim to be from the first generation to grow up alongside computers. In the quest for power but simplicity, a prevailing theme of my generations experience with computers is abstraction away from underlying complexity. It is likely those programming in the 60s, 70s and 80s are far more acutely aware of the implications of computer architecture, such as registers, memory allocation and bus speeds etc. In this increasingly abstracted world, its easy to forget about the computational model, treating it simply as a given. It was especially thought-provoking to hear of the ongoing work at the very foundations of computing itself, addressing the most fundamental criticisms of our painfully sequential models of computation. Quantum computation models show promise in disrupting our current comfort in traditional models. It will be interesting to see whether in years to come, utilizing extra computation leads to increasingly complex higher-dimensional models of information and knowledge in the field of IR, or whether elegantly simple models such as inverse-document frequency will prove difficult to unseat.

In this vein, the scourge of complexity was noted by many speakers. It was inspiring to see both industrial and academic researchers emphasizing that simply adding complexity rather than aspiring to elegance with deeper understanding can undermine our field.

Alongside contemplation on complexity, attending the Turing Centenary provided me with one particular memorable quote from Alan Kay: “the best way to predict the future is to invent it”. And, maybe continuing the computing science tradition of working throughout the night will be the catalyst, with tales amusingly recounted by so many of the Turing Award winners.

References

[1] C.J. van Rijsbergen. Turing and the origins of digital computers. *Aslib Proceedings*, 37(6/7):281–285, 1985.