Research Assessment Exercise 2020
Impact Overview Statement

University: City University of Hong Kong
Unit of Assessment (UoA): 11 Mathematics and Statistics
Total number of eligible staff of the university in the UoA: 25

(1) Context

Our UoA currently comprises staff from the Department of Mathematics and the School of Data Science. The largest share of the research carried at the UoA is in applied mathematics but there is a presence of pure mathematics research as well.

Non-academic users of our research output are not evenly distributed and reflect the development of Hong Kong in the past decades (e.g., manufacturing activity has mostly moved to Mainland China whereas financial services have been on the growth). In addition, we consider society at large (Hong Kong and beyond) an end user of our work and approach an impact to it through various forms of public engagement (such as talks at secondary schools or art galleries).

(2) Approach to impact

- A main feature in our approach to impact is the collaboration with non-mathematicians, both within and outside academia (irrespective of the fact that the impact sought has not an academic character).

  Within City University, there has been a collaboration of Felipe Cucker with colleagues from Electronic Engineering within the framework of a Collaborative Research Fund of the RGC (2014-2017). As a result of this collaboration a patent (Title: "Method for Determining Optimal Laying Arrangement of Infrastructure Link", US Patent number: US 10,425,280 B2) has been granted (Date of Patent: 24 September 2019) with Cucker as one of the inventors. Other collaborations include that of Benny Hon with Anna Hui (Dept. of Applied Social Sciences), Daniel Ho with L.F. Yeung (Electronic Engineering), Xian Zhou with Jun Fan (Materials Science), or Cucker with Hector Rodriguez (School of Creative Media).

  Collaborations with the private sector and government bodies were also encouraged. This was done through the annual performance appraisal that members of the university fulfill and on which activities of this sort are rewarded.

  A representative example is the collaboration of Benny Hon with doctors from Union Hospital and Queen Elizabeth Hospital (in Hong Kong) to develop a computer aid for diagnosis/detection in liver transplants.

- Another feature in our approach to impact is the impulse, in accordance with guidance note 7.4(c), of undergraduate students' internships in the private sector.

  A case at hand is that of the final year student Mr Ng Chung who developed a pricing model of Chinese medicines for the company Pura Pharms. The outcome of this internship created an opportunity for knowledge transfer to industry. Mr Ng Chung is presently working at the Standard Chartered Bank. Another example is that of students S.Y. Yang and Z.Y. Zheng

who, led by Benny Hon, assisted the Hong Kong Society for Rehabilitation in developing an efficient booking system.

- A last feature in our approach to impact is the presence of our graduates in various levels of Hong Kong society and our regular interaction with them. This is most visible in the provision of financial services where both the prominence of Hong Kong and the history of our department favour a continuous matching. Examples are the case of Minjie Yu who obtained a PhD under the supervision of Qiang Zhang and is now the Head of the XVA trading desk at HSBC Asia-Pacific, of Alvin Tse who graduated from our MSc in Mathematics for Finance and Actuarial Science and is now Head of Co-branded Sales Partnership at Principal Hong Kong, and of Zorrow Lo who graduated from our BSc in Computing Mathematics and is now Business Analyst at BNP Paribas.

(3) Strategy and plans

Even though our approach to impact has proved fruitful (our two impact cases being examples) we plan to enhance/complement this approach with a number of measures to further encourage research projects and activities conducing to impact.

These include the supervision of PhD students within a collaborative framework with industry (we are at this moment exploring the possibility of such framework with Huawei on which PhD students would be jointly supervised, working 2 years at CityU and 2 years at a Huawei lab at the Hong Kong Science Park) and a hiring policy that complements our current focus in applied analysis with researchers working in areas of mathematics closer to applications (finance having the weight it has in Hong Kong, we are currently hiring experts in Probability and Statistics with expertise in applications to finance).

(4) Relationship to case studies

The two impact cases submitted provide evidence of our belief in the eventual impact of quality research. They also showcase two radically different forms of impact. The end user for the first of them (Art and Mathematics) is society at large. Its impact is on public engagement. The end user of the second one (Yang-Zhang Optimal Volatility Estimator) are the professionals of the finance sector. Both of them are fruit of the interaction with experts in fields outside our comfort zone of mathematically motivated research.