

CHEONG SIEW ANN

School of Physical and Mathematical Sciences at NTU, Singapore



Dr CHEONG Siew Ann was born in Singapore in 1969. After getting through his primary, secondary, and junior college education in Ama Keng Primary School, the Chinese High School, and Hwa Chong Junior College respectively, and thereafter a contract service with the Singapore Armed Forces, he studied physics at the National University of Singapore. He graduated in 1997 with a BSc (Hons) degree in physics, and went on to obtain his PhD in theoretical condensed matter physics from Cornell University in 2006. He then spent a year and a half as a postdoctoral associate with the Cornell Theory Center, working on biological sequence segmentation, before joining the Nanyang Technological University as an Assistant Professor in Physics and Applied Physics in August 2007. His main research interest is in developing data analysis methods and toy models for understanding the dynamics of complex systems such as biological macromolecules, the brain, earthquakes, financial markets, and infectious diseases. In particular, he works extensively with high-frequency, large-volume time series data, to cluster them, segment them, and also to estimate complex networks based on significant events in such data. His other research interests are in the areas of computational physics and condensed matter physics.

ANDREA NANETTI

School of Art, Design and Media at NTU, Singapore



Andrea Nanetti is Associate Professor at Singapore Nanyang Technological University School of Art, Design and Media and founding Vice-Director of the International Research Center for Architectural Heritage Conservation at Shanghai Jiaotong University. He is advisor to public and private institutions and individuals in Italy, Greece, and China on Heritage Science internationalisation projects. A historian by training (Medieval and Renaissance studies), Andrea Nanetti has both academic and entrepreneurial experience in helping to develop Heritage Science as a domain. His main research interest is in innovation and change in heritage interpretation processes. As a scholar he applies interdisciplinary and trans-disciplinary methods to the study of *regional* man-heritage-landscape systems, *national* art-heritage-politics relationships, and *global* histories of intercontinental heritage networks. As an entrepreneur he adopts transnational and cross-disciplinary approaches in access to heritage (ICT tools, new media, and contemporary art), conservation-restoration (selection and coordination of Italian and other European masters for Chinese construction companies, establishment of artworks restoration labs in China), and support to heritage management (advisor to public and private institutions in strategic decisions).

Sustainable Heritage Impact Factor Theory (SHIFT): A Framework for Qualitative and Quantitative Assessment of Cultural Heritage

Against the backdrop of SG50, Singapore is seeing an awakening to all things old. More and more people are calling for the preservation of the past, and insisting that the destruction of our shared memories is too high a price to pay for economic progress. But as early as 500 BCE, Greek philosopher Heraclitus observed that “everything changes and nothing stands still”. This is truer today than ever, as nations seek to climb over each other to better their fortunes. Can Singapore afford to have time stand still for us alone? Can we have the progress at a lower cost to our heritage? How do we strike the balance between conservation and development? The answer to the first question is clearly no, but to publicly debate the other questions, we need to have a better understanding of what constitutes our heritage and what do not. We need to have a scientific theory of heritage, to guide the collection of data and documentation of heritage, and to frame questions related to heritage policies. In this talk, we will describe a complexity science framework for such a theory, which we would like to call the Sustainable Heritage Impact Factor

Theory (SHIFT). We will explain how adaptive social interactions between individuals in a community can lead to the emergence of persistent patterns over time. The strongest of these patterns, which we identify with intangible cultural heritage (ICH), serve important functions to keep the community cohesive, productive, and resilient. We then describe how these ICH patterns are replicated across space and time, transmitted from one generation to the next, and transformed as the challenges faced by the community change. As these replication, transmission, and transformation processes play out over the natural and architectural landscape we live in, certain places, buildings, and monuments gain added significance because of the roles they play in facilitating these processes. These places, buildings, and monuments thus become for us tangible architectural or nature heritage. Guided by this theory of heritage processes, we then delve deeper to understand what kind of data these processes generate, how we can organize them, and how to use this theory of data to qualitatively and quantitatively assess the value of various ICH patterns. We will end the talk by describing a SHIFT case study of Tiong Bahru, and discuss how this old township in Singapore can remain culturally vibrant and relevant to the present times.