



# Summer Solstice 2018 Conference on Discrete Models of Complex Systems

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## Data integration: exploring the link between complex networks and neural networks

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We are immersed in a Big Data ocean that contains many different data streams: molecular, images, clinical, social, behavioral, biometric, environmental, etc. Therefore data integration is nowadays one of the most important scientific and technological challenges. I will highlight similarities and differences among four useful methodologies in data integration. The first type of analysis we propose is a multilayer network approach. Another methodology is deep learning neural networks (supervised and unsupervised). The third approach is matrix factorisation and finally network regression. In particular I will show how coupling between multilayer networks and deep learning could lead to cross modal and attention Networks. I will end with practical issues related to implementation and coding.