QUANTUM MACHINE LEARNING MEETINGS
KWAZULU-NATAL, SOUTH AFRICA

SUMMER SCHOOL 23 Jan - 1 Feb 2017 *draft programme*

Week 1: Introductions to Machine Learning and Quantum Information

Time	Monday	Tuesday	Wednesday	Thursday	Friday
9:00-10:30	Arrival	How to train models with data (Peter Wittek)	Neural networks (Uwe Jaekel)	Kernel methods (Uwe Jaekel)	Reinforcement Learning (Katja Ried)
10:30-11:00		*Tea break*			
11:00-12:30		Introduction to Python and scikit-learn (Peter Wittek)	Neural networks prac* (Uwe Jaekel)	Kernel prac* (Uwe Jaekel)	Reinforcement Learning prac* (Katja Ried)
12:30-14:00	*Lunch break*				
14:00-15:30	Welcome and introduction (Francesco P and Maria S)	Quantum computing (Francesco Petruccione)	Biomimetic quantum devices (Enrique Solano)	Quantum algorithms (Francesco Petruccione)	Quantum annealing & D-Wave (John Realpe Gomez)
15:30-16:00	*Tea break*				
16:00-17:30	Coding tutorial & setting up laptops for pracs (Maria S and Mark F)	Quantum computing prac* (Mark Fingerhut)	Biomimetic quantum devices (Enrique Solano)	Quantum algorithm prac* (Mark F & Maria S)	Optimization & sampling using D-Wave* (Marcello Benedetti)

**Practicals contain programming exercises and tutorials to apply the content of the previous talk*
Note: Evening programmes, excursions and a coding challenge will be organised

Week 2: Research in Quantum Machine Learning

Time	Saturday	Sunday	Monday	Tuesday	Wednesday
9:00-10:30	**Delegates' session (Everyone)**	**Free time**	**Matrix Inversion in a Quantum Computer (Maria Schuld)**	**Quantum-assisted learning of probabilistic models (John Realpe Gomez)**	**Discussion & Conclusions (Everyone)**
10:30-11:00	***Tea break***		***Tea break***		
11:00-12:30	**Delegates' session (Everyone)**		**Practical* (Maria Schuld)**	**Learning probabilistic models using D-Wave* (Marcello Benedetti)**	**Presentations programming challenge**
12:30-14:00	***Lunch break***		***Lunch***		
14:00-15:30	**Free time**		**Quantum Projective Simulation (Katja Ried)**	**Quantum Mechanics for Artificial Intelligence (Peter Wittek)**	**Departure**
15:30-16:00			***Tea break***		
16:00-17:30			**QPS Practical* (Katja Ried)**	**Practical* (Peter Wittek)**	