Hong Kong Observatory Summer Placement Programme 2022

Project Ref.	Project Title	Job description	Subject and year of study required	Specific knowledge / skills required / remarks
F2	Fine tuning of open source conversational AI platform for chatbot	Assist in developing the RASA model and user interface for fulfilling different functions of the HKO Chatbot such as weather enquiry and resource recommendation. Explore ways to adopt different NLP models in RASA to improve accuracy.	Computer Science, Software Engineering or related disciplines. Completion of 2nd year of study is required.	- Experiences in coding using languages such as Python, C++, etc. - Knowledge in NLP/machine learning is preferred.
F3a	Classification of local weather types by cluster analysis	To select principal weather elements from meteorological observation networks and perform cluster analysis to define the typical local weather types of Hong Kong / Greater Bay Area. To identify the corresponding synoptic weather patterns by analysing past weather and/or climate composite data for prescribing local weather types.	Meteorology, Physics, Earth System Science, Mathematics, Statistics, Computer Science or related disciplines. Completion of 2nd year of study.	- Knowledge in meteorology required. - Experience in programming (e.g. Python, R), machine learning, data analysis preferred.
F3b	Urban-scale temperature forecasts using machine learning	To enhance machine learning algorithm for downscaling the temperature forecasts from computer weather models, observations at automatic weather stations and their surrounding urban environmental characteristics (e.g., surface cover, land use and urban geomorphology). Verify and compare the performance of the developed algorithm with other statistical post-processing methods currently in use.	Meteorology, Physics, Earth System Science, Mathematics, Statistics, Computer Science or related disciplines. Completion of 2nd year of study.	- Genuine interest in meteorology/ urban climate. - Knowledge in machine learning, programming (e.g. Python, R), data analysis preferred. - Experience in geographic information system (GIS) would be a plus.
F3c	Review and enhancement of cloud cover	To study performance of the computer weather models in forecasting cloud cover against synoptic weather observations. To improve the	Meteorology, Physics, Earth System Science, Mathematics,	- Genuine interest in meteorology. - Knowledge in programming

	forecasts	algorithm for generating weather icon in the HKO's Automatic Regional Weather Forecast portal (https://maps.weather.gov.hk/ocf/) by exploring forecast cloud cover on various levels and predicted sunshine amount.	Statistics, Computer Science or related disciplines. Completion of 2nd year of study.	(e.g. Python, R), data analysis, model evaluation preferred.
F3d	Rainstorm tracking with machine-learning algorithms	To enhance the machine-learning algorithms for identifying and tracking rainstorm objects on radar imagery and nowcasting of their development.	Physics, Earth System Science, Mathematics, Statistics, Computer Science or related disciplines. Completion of 2nd year of study.	- Genuine interest in meteorology. - Knowledge in data processing, machine learning and skills in using statistical analysis libraries written in Python are preferred.
F4	Development and enhancement of big data analytics tools for monitoring and predicting weather-related impacts	Develop and enhance artificial intelligence tools and applications for image and meteorological data analysis.	Physics, Earth System Science, Mathematics, Statistics, Computer Science or related disciplines. Completion of 2nd year of study.	- Knowledge in development of machine learning algorithm or artificial intelligence applications using Python and Tensorflow preferred.
A4	Development of night-time visible satellite imageries using deep learning model.	Prepare training dataset using a combination of Himawari-8 satellite imageries in different channels for running a deep learning model to generate night-time visible imageries; carry out comparison, evaluation and optimization of model results.	Earth System Science, Data Science, Computer Science or related disciplines. Completion of 2nd year of study.	- Genuine interest in meteorology. Computing skills including Linux and python programming. - Experiences in machine learning and hands-on skills with Tensorflow or PyTorch are preferred.
A6a	Enhancement of icing hazard forecast for aviation safety	Develop and enhance numerical weather prediction icing forecast products based on pilot reports and verification. Explore prediction of icing severity and probabilistic	Physics, Earth System Science, Mathematics, Statistics, Computer Science or related	- Genuine interest in meteorology. - Experience using Python programming language and

		forecasts using machine learning techniques.	disciplines. Completion of 2nd year of study.	statistical analysis would be an advantage.
A6b	A study on developing a global satellite nowcasting system for aviation applications	Study and enhance the algorithms for performing nowcasting of significant convection based on globally stitched satellite images. The student would be able to work with high performance computing and apply meteorological knowledge on developing operational products.	Physics, Earth System Science, Mathematics, Computer Science or related disciplines. Completion of 2nd year of study.	- Genuine interest in meteorology. - Experience using C++, Python programming language and the use of GPU in programming would be an advantage.
D2	Graphic revamp of the Observatory's webpages for marine and earthquakes	Revamp the Observatory's webpages for Hong Kong Port Meteorological Services (https://www.hko.gov.hk/en/wservice/tsheet/pms/index.htm), Understanding Earthquakes (https://www.hko.gov.hk/en/gts/equake/item_list.htm) and Tsunamis (https://www.hko.gov.hk/en/gts/equake/und_tsu.htm) with user friendly design and infographics. Web accessibility requirements should be followed.	Creative Media, Digital Communication, Computer Science or related disciplines. Completion of 1st year of study.	- Good knowledge in JavaScript, HTML5, CSS. - Skills in graphic design and motion graphics software Adobe Illustrator or Photoshop would be an advantage. - Interest in infographic and webpage design. - Submission of a portfolio showing previous design work is preferred.
D4 [two students]	Production of educational and promotional videos for the Observatory	Assist in the production of educational and/or promotional videos for HKO, including screenwriting, filming and post-production. The videos may be broadcast on local TV channels (as part of "Cool Met Stuff" series), and/or uploaded to HKO social media platforms including YouTube and Facebook.	Film and television, creative media, multimedia technology, animation or other related disciplines with an emphasis in digital video production. Completion of 2nd or 3rd year of study.	Strong knowledge in **(A)** digital video production and editing software (e.g. Adobe Premiere), **OR** **(B)** animation production and software (e.g. Adobe Illustrator, After Effects). Strong skills in both **(A)** and **(B)** above will be an advantage.

				Applicant must submit a portfolio of previous work. Please specify your role involved in each of the videos submitted.
R2a [two students]	Gamification for understanding hazardous weather phenomena	Design and develop online interactive games for engaging the public to understand the cause and impact of hazardous weather phenomena and the associated precautionary measures.	Digital Communication, Computer Science or related disciplines. Completion of 1st year of study.	Good knowledge in JavaScript, HTML5, CSS. Skills in graphic design software Adobe Illustrator or Photoshop would be an advantage.
R2b	Design of infographics and motion graphics for radiation ebook	Refine the graphics in the illustrations of the radiation e-book. Produce infographics and motion graphics to introduce radiation concepts and provide education activities. Enhance the navigation and layout of the responsive webpage to suit desktop and mobile versions.	Creative Media, Visual Arts, Digital Communication or related disciplines. Completion of 1st year of study.	- Good knowledge and skills in graphic design software (e.g. Adobe Illustrator, Photoshop, After Effects). - Interest in infographic design. - Knowledge in motion graphics and animation production. **Submission of a portfolio showing previous design work is required.**
R4	Design and development of innovative online means to deliver radiation related knowledge	To create, design and develop online activities to facilitate knowledge and information sharing on radiation related matters.	+Visual Arts, Creative Media, Arts and Cultural Management or related disciplines. +Completion of 2st year of undergraduate study preferred.	- Be innovative and co-operative. - Knowledge and/or experience in curating ideas and concepts through digital and artistic means. - Knowledge in webpage design and development.