Education in BDI

MSC in Big Data Technology

Big data is poised to change the way enterprises function and a society operates, and is changing the way science and engineering is conducted.

A Master of Science programme in Big Data Technology jointly offered by the Departments of Computer Science and Engineering and Mathematics in HKUST integrates different disciplines together to allow students to know all the important aspects of the big data and how it is used in the real world.

This highly competitive and sought-after programme offers both full-time and part-time modes of studies in 1 or 2 years respectively, with student intakes in both Fall and Spring every year.

A new BSc in Data Science is established at HKUST as a joint program between Computer Science and Engineering and Mathematics. This new program in BDI will offer an undergraduate major program in data science from September 2018 onwards.

HKUST 25th Anniversary Cluster Hired Faculty Members

An important part of the BDI is its highest quality faculty members. Besides our affiliated faculty members from across the university, a significant part of the university’s 25th year anniversary clustered hiring initiative, five new members of BDI faculties are in place for multi-disciplinary research and education. These new faculty members include professors Yanggu Song from CSE/MATH, Jun Jiang Wang from BME/LIFS, Yue Yue from Math /BME, Kohei KAWAGUCHI from Econ and Yu HU from MATH/LIFS. Their research spans from social media analytics, machine learning in natural language processing and text, statistical learning, bioinformatics and genetics to data analytics in economics and marketing.

BDI Highlights

Qiang Yang

BDI Director and New Bright Professor of Engineering Qiang Yang is the Editor-in-Chief of the IEEE Transactions on Big Data.

Lei Chen

BDI Associate Director Professor Lei Chen is the Editor-in-Chief of the VLCD Journal and Associate Editor in Chief of the IEEE TKDE Journal.

Ke Yi

BDI member Professor Ke Yi received ACM SIGMOD Best Paper Award 2016 and ACM SIGMOD Best Demonstration Award 2015.

Kai Chen

BDI and WHAT Lab member Professor Kai Chen and Tencent launched a new big-data and AI platform known as Angel and Amber to tackle the fast-growing big data analytic demands at WeChat and Tencent Cloud.

Huamin Qu

BDI and WHAT Lab member Professor Huamin Qu’s WeSeer system is being used to analyze the information-diffusion patterns of millions of news articles each day.

Overview

HKUST BIG DATA INSTITUTE (BDI)

The BDI was established at Hong Kong University of Science and Technology (HKUST) to serve the dual purposes of research and education in Big Data and Artificial Intelligence. This is a multi-disciplinary, multi-center based program to cover all areas related to data analytics and artificial intelligence at HKUST, with members including School of Engineering, School of Science, School of Business and Management and School of Social Science. As a place for cutting edge research and application in Big Data and AI, the institute serves to bridge academic research and education and industry. BDI’s goal is to deliver significant international impact and become a leader in the Asia Pacific region in Big Data research, practice as well as education. The institute will develop cutting-edge AI and big data technologies in smart city, business intelligence, health and well-being, bioinformatics and genetics, e-commerce, security and privacy, policy and robotics.
Big Data and Artificial Intelligence

Last few years have witnessed a dramatic increase of data in our lives and work. Much of this data arrive in large volumes and high velocity, have large varieties of formats and contain much noise. An issue for Big Data research is how to store, transport and analyze such data. An important tool to make use of the big data is artificial intelligence, where advanced analytic methods such as deep learning are being used to derive value from the data and make accurate predictions.

HKUST has a long history of leading in AI and Big Data research, applications and education. It is the place where there are two Fellows of Association for the Advancement of Artificial Intelligence (AAAI), many Fellows of IEEE as well as Editor in Chief of many leading international journals including the IEEE Transactions on Big Data. It is the birthplace of the world-famous drone company DJI, and home to many new inventions in Big Data and Artificial Intelligence. Systems and products coming out of HKUST are being used in many places in the world.

BDI Organizational Structure

The BDI consists of both research and education components. The research part consists of the following labs:

- A WeChat-HKUST Joint Lab on Artificial Intelligence (WHAT Lab), which aims at social networking big data mining and machine learning, natural language processing and robotics research.
- A Big Data Bio-Intelligence and Machine Learning Lab (BDI-ML Lab), which aims at the development of advanced machine learning systems and promoting applications of machine learning in bio and genetic areas.
- A Smart City Transportation Center which is aimed at using AI and Big Data technologies in smart city applications.

The educational component of the BDI consists of a Joint Master’s Degree Program in Big Data Technology and a Bachelor’s Degree Program with Computer Science and Engineering Department and Department of Mathematics. Over 100 students graduate from these programs each year.

WHAT Lab

The WHAT Lab is dedicated to foster artificial intelligence (AI) and big data research to improve people’s living and advance the frontiers of knowledge, marking a milestone in the collaboration of WeChat and the higher education sector through HKUST, jointly conducting AI technology related research and explore its far-reaching frontiers.

Today’s AI technology is experiencing tremendous growth, and much of this advance depends on talents, problems and data. WeChat and HKUST complement each other in these aspects, and this collaboration on AI research is expected to be long-term and world-leading.

Research areas of WHAT Lab include intelligent robotic systems, natural language processing, data mining, speech recognition and understanding. The Lab will bring together top researchers in the development of innovative artificial intelligence application with the data-base of WeChat.

BDBI and Machine Learning Lab

Big Data for Bio Intelligence Lab

The BDBI-ML Lab aims to develop advanced deep learning technologies and apply them to bio-related areas. Research areas include new big data solutions such as “deep learning” and “transfer learning”, which generate rich features to describe a machine learning problem in order to let computers make intelligent decisions, and “transfer learning” that allows computer models to be easily adapted for use in many related application domains. It will also apply these solutions to organic farming with objectives in making the processes more automatic and user-friendly and scaling it to cater to very large data sources.

People Aware Smart City

The people-aware smart city project consists of a Thales-HKUST ITF project to generate early warning for public places such as subway in case of emergency, and a people-centered big data integration and analytic project with Digital China and ITF. The projects will integrate big data extracted continuously from the people, cars and their environment to discover people’s needs from integrated multi-source data, and to determine the best resource allocation plans to satisfy their needs.

People’s needs from the areas of education, health, travel, safety, finance and entertainment, which all have measurable objectives, will be studied in this project.

In order to achieve the goals in the framework, several state of the art techniques will be developed including data integration solutions to handle different data sources with different formats, transfer learning-based mechanisms to reveal knowledge, and machine-human collaborative approaches to make wise decision.