

## INTERNATIONAL ADVISORY BOARD

Prof.Dr. Peter Robinson (University of Cambridge, UK)  
Prof.Dr. Sergio Velastin (University of Kingston, UK)  
Prof.Dr. Timothy K. Shih (University of National Central, Taiwan)  
Prof.Dr. Alan F Smeaton (Dublin City University, Ireland)  
Prof.Dr. Marc Liao (IIS, Academia Sinica, Taiwan)  
Sridhar Sunkad (EON Reality Pte. Ltd., Singapore)  
Dr. Suhazimah Dzalzali (MAMPU, Malaysia)  
Dr. Dzaharuddin Mansor (Microsoft Malaysia Sdn. Bhd.)  
Ivan Teh (Fusionex Sdn. Bhd., Malaysia)



## Research Areas in Postgraduate Studies

**Institute of Visual Informatics**  
**Universiti Kebangsaan Malaysia**

**CONTACT US**  
**[www.ivu.ukm.my](http://www.ivu.ukm.my)**

*Institute of Visual Informatics (IVI)*  
*Universiti Kebangsaan Malaysia*  
*43600 UKM Bangi, Malaysia*

*Tel: +603-8921 6079*  
*Fax: +603-8921 6072*



*Inspiring Futures,*  
*Nurturing Possibilities*

**[www.ivu.ukm.my](http://www.ivu.ukm.my)**



# INSTITUTE OF VISUAL INFORMATICS



## INTRODUCTION

The Institute of Visual Informatics (IVI) was established on the 1st of July 2010 as one of the multidisciplinary Institute within the structure of Universiti Kebangsaan Malaysia (UKM), in the field of visual informatics. The field of Visual Informatics represents one of the most challenging and inspiring areas of research in computer science and Information Technology, encompassing areas such as virtual reality, visualization, simulation, intelligent data analytics, image processing, computer vision and image processing. IVI has one Principle Investigator, four Senior Research Fellows, seven Research Fellows and ten Associate Fellows. The Fellows and Associate Fellows of the Institute are experienced researchers (100% PhD holders) who are all passionate and dedicated to their respective fields of research. They have presented their findings at various conferences and are recipients of various research and innovation awards both at the national and international levels. Postgraduate students (Masters by research and PhD) are vital to the Institute's research. As they research, design and develop new inventions and innovations, they stimulate the Institute's larger research effort and contribute to the advancement of the field in Visual Informatics. We have been able to attract students both locally and internationally who want to work at the frontier and leading edge research in visual informatics. The Institute is privileged to have a credible International Advisory Board comprising of high profile individuals from academia and industry both nationally and internationally that represent countries from United Kingdom, Australia, Sweden, Taiwan, and Malaysia.

### Vision

Institute of Visual Informatics is committed to be a leading Centre of Excellence in research and innovation in the field of Visual Informatics.

### Mission

To be a centre of excellence of choice in the field of Visual Informatics that is of global standing, by conducting frontier and cutting-edge research to lead new knowledge for better quality of life.

### Programme

Programme offered at Institute of Visual Informatics are as follows:

#### Doctor of Philosophy/Masters:

- Simulation and Visualisation
- HCI and Usability Engineering
- Computer Vision and Image Processing
- Intelligent Visual Data Analytics

Simulation involves the creation of a computer model to represent real-world phenomenon or systems, typically built upon mathematical models and sciences to predict and visualise the behavior of the simulated systems. The research in simulation has the potential to contribute to areas such as:

- Navigation training
- Robot simulator
- Weather forecasting and disaster prediction
- Fault analysis
- Visual Simulation

Visualization is a study of visual representations of abstract data to reinforce human cognition. This research field is based on two components; visual design and visual computing. Among the research areas are the following:

- Interactive and Immersive Visualization
- Object recognition
- Visual Image/Video Encoding
- 3D reconstruction
- Computational Photography
- Visual Learning

Human Computer Interaction (HCI) is a discipline concerned with the study, design, construction and implementation of human-centric interactive computer systems. Usability engineering is a field that is concerned generally with human-computer interaction and specifically in designing human-computer interfaces with high usability. It provides structured methods for achieving efficiency in interface design. The thematic areas such as in design, entertainment, education, technology, UX and usability. The research areas includes:

- Analysis and design methods
- e-Learning and Distant Learning
- Emotions in HCI
- Game Design
- Gamification Interface
- Entertainment Systems
- HCI methods and theories
- Adaptive and personalized interfaces
- Haptic user interface
- Information visualization
- Interaction design
- Virtual and Augmented Reality environments
- Mobile HCI
- Natural user interfaces (NUI)
- Smart home

Computer Vision is a research field of computer science that intends to model and capture the real world encompasses both fundamental theory and technique. The research areas of computer vision includes:

- Edge detection
- Image segmentation and reconstruction
- Object identification and recognition
- Visual tracking
- Remote collaboration

Real-time Virtual Image processing covers three major fields namely, the Real-time processing, Virtual Images and Virtual Image Processing. These fields include research in the following areas:

- Raster to vector conversion and vice versa
- Image conversion
- Image processing
- Virtual Image Technique
- Visual data management
- Response time
- Virtual reconstruction
- Virtual Image recognition
- Virtual Image Inspection technique
- Embedded system
- Visual simulation
- Virtual reality
- Multi-touch Technology

The aim of Intelligent Visual Data Analytics is to generate analytical result and insight from the flood of data. The field of visual intelligent data analytics focuses on handling massive, heterogeneous, and dynamic volumes of information by integrating human judgment by means of visual representations and intelligent techniques in the analysis process.

Research field:

- Application domain of Visual Analysis
- Analytical Reasoning
- Artificial Intelligence
- Data Mining
- Data Modelling
- Data/Information/Knowledge Visualization
- Knowledge Discovery
- Intelligence Analysis
- Machine Intelligence
- Pattern Analysis
- Sentiment Analysis
- Social Computing
- Visual Analytics
- Visual data exploration
- Visual Data/Knowledge Discovery
- Visualization for Information Retrieval

