## Project proposals in Computer Vision

## Computational Psychology, Artificial intelligence, Bioinformatics

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Project type **:** Software development projects MSc.

1. Computer vision (machine vision) has a broad application area in industry, traffic management, security (CCTV), health, communication, robotics and military. Particularly the development of a real-time computer vision software will help gain a productive skills and knowledge, which will give boosting effect in your career life.
2. Computational Psychology is the quantisation method to measure psychological (mental or cognitive) parameters which contribute several fields like cyber security, mental disorder analysis, e-commerce, etc. The method includes console/computer games domain, user signal collection, and AI techniques to characterize cognitive behaviours.
3. Artificial intelligence is very generic technique (e.g. Bayesian networks) which can be exploited in different fields such as automated dynamic scene analysis and interpretation, biological behaviour analysis, security, etc. This area can easily fit to your specific personal application projects.
4. Bioinformatics is a multidisciplinary field which merge genomic properties (e.g. DNA structure of human Cells/viruses) and computer science to combat against diseases, characterize human genome, produce vaccines, etc.

Those who wish to undertake a project in one of above topics for MSc, can select one or more of specific project topics as shown below. The students are expected to have programming background and develop software codes in C/C++, visual basic, MATLAB, etc. associating with hardware like CCD camera/s, game console, body signal collection devices, video microscopy, etc.

Topic 1.

Biometric applications ( Finger print identification, face recognition, stereo-image based body identification, cognitive biometry) This fields are highly related to security and cyber security.

Topic 2.

Security and Transportation ( CCTV applications, traffic management applications , airport security, behaviour analysis from video files/online data, etc.)

Topic 3.

Medical Health Applications ( medical imaging, Infrared imaging, tissue/skin texture analysis for diseases or abnormality detection.) Our novel method “intelligent Laser speckle Classification” is widely used for health abnormality detection from skin imagery. (e.g. diabetes, etc.) for more info please visit: https://en.wikipedia.org/wiki/Intelligent\_laser\_speckle\_classification

Topic 4.

Industrial Applications ( vision systems for product inspection, robot vision, object tracking, texture analysis, 3D imaging in Aerospace/automotive industry, etc.) particularly 3D stereoscopic imaging technique (Photogrammetric Bundle adjustment) is widely used in different field.

Topic 5.

Biologic cellular communication decoding

This topic of Bioinformatics is involved with decoding “communication language “ between the cells or bacterias to communicate with them at basic level and in further stages understanding their invisible strategies to develop counter strategies to combat diseases. For this kind of research some microscopic video recording utility and AI software are used.

Topic 6.

Computer Imaging and computerised optical analysis methods applicable to pharmaceuticals.

Particularly industrial medical tablet and pharmaceutical powder analysis are commercially very popular fields which attracts broad range of tablet producers (i.e. Bayer, gsk, etc.). In this research you are expected to develop novel alternative method which may bring new optical solutions to traditional pharmaceutical production problems.

Any further suggestion on a collaboration with the above topics (for those who already have their own ideas) are welcome.