

Department of Computer and Information Sciences THESIS PROJECT PROPOSAL PROFORMA

Project Title	HEPATICA: HEPAtic Texture Identification, Classification and Analysis
Nature	Computational
Prerequisites	 Knowledge of the following will be helpful: Machine Learning / Computational Intelligence / Pattern Classification Python Programming Image Processing / Computer Vision Interested students will be required to take courses or conduct supervisor guided self-study in machine learning and image processing (or equivalent) if they lack such background.
Field	Computational Intelligence
Expected Cost (if any)	
Work Place*	PIEAS

*define %age of work to be done in PIEAS or at some other place

Supervisor Information

Name of supervisor and designation		Dr. Fayyaz ul Amir Afsar Minhas, Senior Sc	cientist
Department\Division and Organization		Department of Computer Science, PIEA	AS
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Project Details

Synopsis	Motivation: Hepatic or liver diseases such as hepatitis are one of the biggest killers in Pakistan. As a consequence, correct diagnosis of such disorders is of prime importance. An ultrasound presents an inexpensive tool for this purpose. An example of a liver ultrasound with normal texture and smooth surface is shown below on the left. The right image shows a liver with irregular surface and possibly fatty texture.
	Objectives: The objective of this work is to develop a machine learning model for simultaneously predicting liver surface and textural irregularities. A webserver will be developed which can automatically diagnose the underlying liver conditions given the images.
	For a look into our previous work on the subject please visit: http://faculty.pieas.edu.pk/fayyaz/aci.html#detection-of-fatty-liver- disorder-in-liver-ultrasound
	Skills Resulting from the project: Image analysis, machine learning, Python Programming, Multidisciplinary Research methodologies and publishing.

Goals of the Project

4 th Semester	I. Development of understanding of digital image processing techniques for analyzing liver ultrasounds. II. Developing a baseline predictor
(3 credit hour per week are available)	
5 th Semester	I. Analysis of features and classification schemes II. Benchmarking the predictor III. Development of a webserver for the prediction
are available)	

Instructions

- > All the columns of project proposal forms are mandatory to be filled.
- > The minimum qualification for a supervisor is eighteen years of education plus two years service.
- > The minimum requirement for a co-supervisor is eighteen years of education.
- > In case of external supervisor (outside DCIS), a co-supervisor will be mandatory from faculty.
- Wherever the project work is carried out (including classified establishments), the defense (only examiners and supervisor) and final presentation (open to all) will be held at PIEAS. The presence of supervisor is necessary for all presentations of fourth and fifth semesters.
- > DCIS has right to reject or accept any project.

Signature of Supervisor

Signature Head of the Department

(With name and designation)