MINI PROJECT EVALUATION SHEET

OCES-2023

TSO NAME & CC No.: Rinkesh Hemant Paltiwale, NE/604/279 DISCIPLINE :Computer Science

GUIDE's NAME : Dr. Ratnesh S Sengar DIVISION : DRHR

TITLE OF THE PROJECT : AI based microscopic image stitching algorithm for characterization of reactor core components

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1. GUIDE'S ASSESSMENT

a) PROJECT WORK / REPORT (Maximum Marks: **125**) _____

b) ATTENDANCE & DISCIPLINE (Maximum marks : **25**) _____

Date : Signature of the Guide _____

Date : Signature of Head of Div _____

To
Dr. Ajay K. Singh
Head, OCES PI Section, HRDD

CC: Chairman, Miniproject Viva Committee

Bhabha Atomic Research Centre
Human Resource Development Division
OCES-2023
PROJECT SYNOPSIS

Discipline	**Computer Science**	Date	

Name of TSO	**Rinkesh Hemant Paltiwale**	CC No.	**NE/604/279**

Name of Guide	**Dr. Ratnesh S Sengar**	Division	**DRHR**	Designation	**SO/H**

Email ID	**rssengar@barc.gov.in**	Telephone No.	022-25592139 / 022-69292139

Aim and Objective of Project	**Study and implementation of exisiting stitching algorithms and development of a fast and accurate microscopic stitching algorithm for "In-cell video microscopic imaging system"**

Project Highlights

DRHR has developed an automated in-Cell video microscopic imaging system for defect detection and dimensional measurement of reactor core components using microscopic imaging and stitching. Due to the presence of low texture in micron-sized details, traditional methods and available open-source libraries fail to provide satisfactory results due to the following challenges

1. **Spatial mismatch, mechanical uncertainties and sparsity of image features in adjacent image tiles.**
2. **Computational complexity and memory requirements of available solutions.**

The project is focused on understanding of microscopic imaging challenges, image registration and image blending, Image acquisition from "In-cell video microscopic imaging system", Development of stitching algorithm and stitching images to compare results with existing stitching solutions.

Actual Contribution of TSO	**Calculation of optimum overlap to compute homography, Using linear regression to calculate pixel overlap in case homography is erroneous, Performance improvement in stitching by reducing complexity of perspective transformation to euclidean transformation implemented with only translation, Dataset generation for improving linear regression model.**

Language and Tools used for Project	**Python3, OpenCV, scikit-learn, Proprietary DRHR imaging software**

Current Status of the Project ▶	Completed		Partially Completed		To be Completed	

Guide's Remarks	

Signature of Guide

To
Dr. Ajay K. Singh
Head, OCES PI Section, HRDD

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