ERCIM "ALAIN BENSOUSSAN"
FELLOWSHIP PROGRAMME

ERCIM
European Research Consortium
for Informatics and Mathematics

Scientific Report

First name / Family name	VIJAY KUMAR NEELURU
Nationality	INDIAN
Name of the *Host Organisation*	Fraunhofer IPA
First Name / family name of the *Scientific Coordinator*	BIRGIT GRAF
Period of the fellowship	01/11/2021 to 31/03/2022

I – SCIENTIFIC ACTIVITY DURING YOUR FELLOWSHIP

Work Done

3D Object Reconstruction

- Experimented with point cloud based hole detection algorithms. This algorithm will be helpful in filling the holes in point cloud.
- Implemented and integrated foreground segmentation algorithm into the existing 3D reconstruction pipeline. This algorithm will extract the foreground object mask which is consumed by the voxel carving algorithm to generate the 3D reconstruction result.
- Deep learning techniques (UNISURF, VAXNERF) are applied to reconstruct the 3D objects based on images. Proposed a new approach based on UNISURF for 3D model reconstruction by combining the images and point cloud.

- Experimented with different algorithms for removing the reflections in images. The images with less reflections can be used in the subsequent steps of 3D reconstruction and texturing.
- Evaluation of 3D models are important to assess the generated 3D models. Implemented geometry and texturing evaluation metrics and integrated in to the 3D reconstruction pipeline.

II – PUBLICATION(S) DURING YOUR FELLOWSHIP

- None

III – ATTENDED SEMINARS, WORKHOPS, CONFERENCES

- ROS-Industrial Conference 2021

IV – RESEARCH EXCHANGE PROGRAMME (REP)

- None