

Enhancing Place Recognition using Joint Intensity - Depth Analysis and Synthetic Data



Elena Sizikova*, Vivek K. Singh**, Bogdan Georgescu**, Maciej Halber*, Kai Ma**, and Terrence Chen**

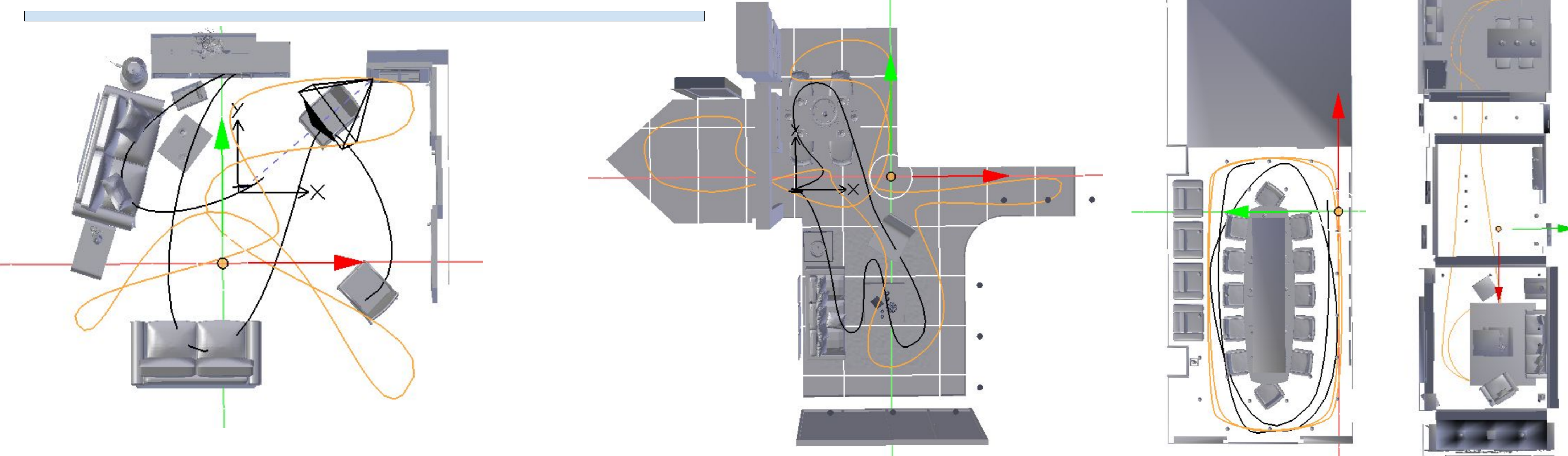
*Department of Computer Science, Princeton University

**Medical Imaging Technologies, Siemens Medical Solutions Inc., Princeton, NJ



Motivation

- Does synthetic depth data help with place recognition?
- Do color and depth channels complement each other?



Training: Synthetic Depth Generation

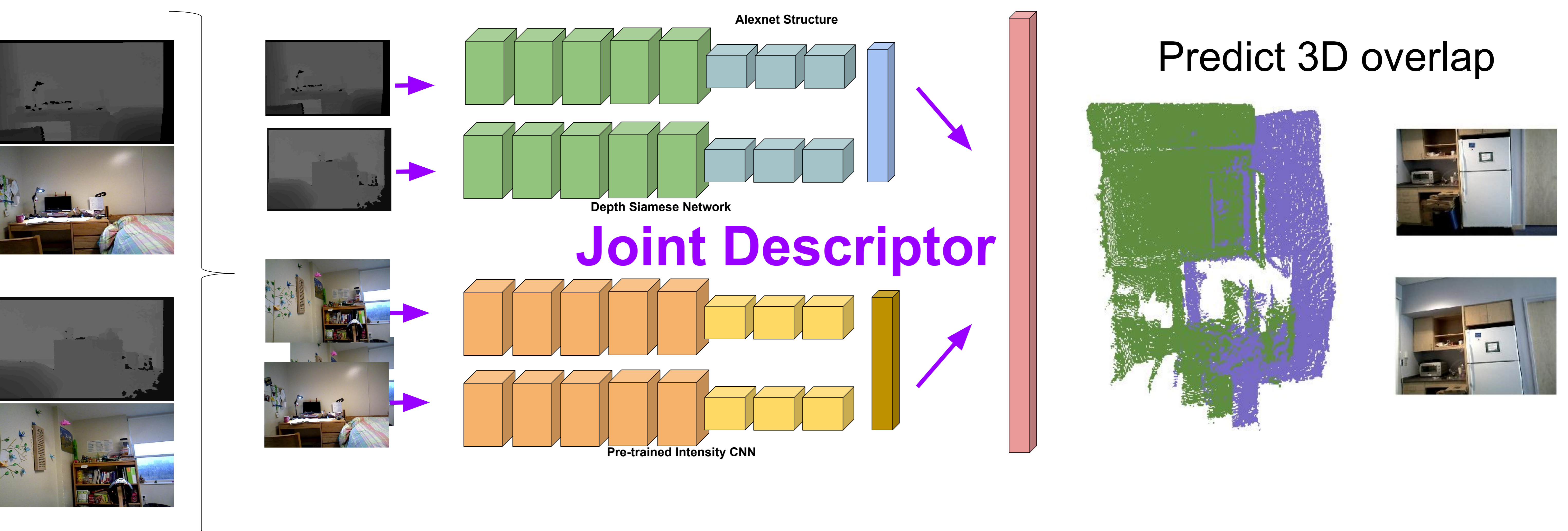
Synthesize 1.2 million depth images from trajectories in synthetic 3D rooms

Test Time: RGB-D Images

Combine features from depth and Intensity in a joint overlap predictor using a robust mean

Prediction

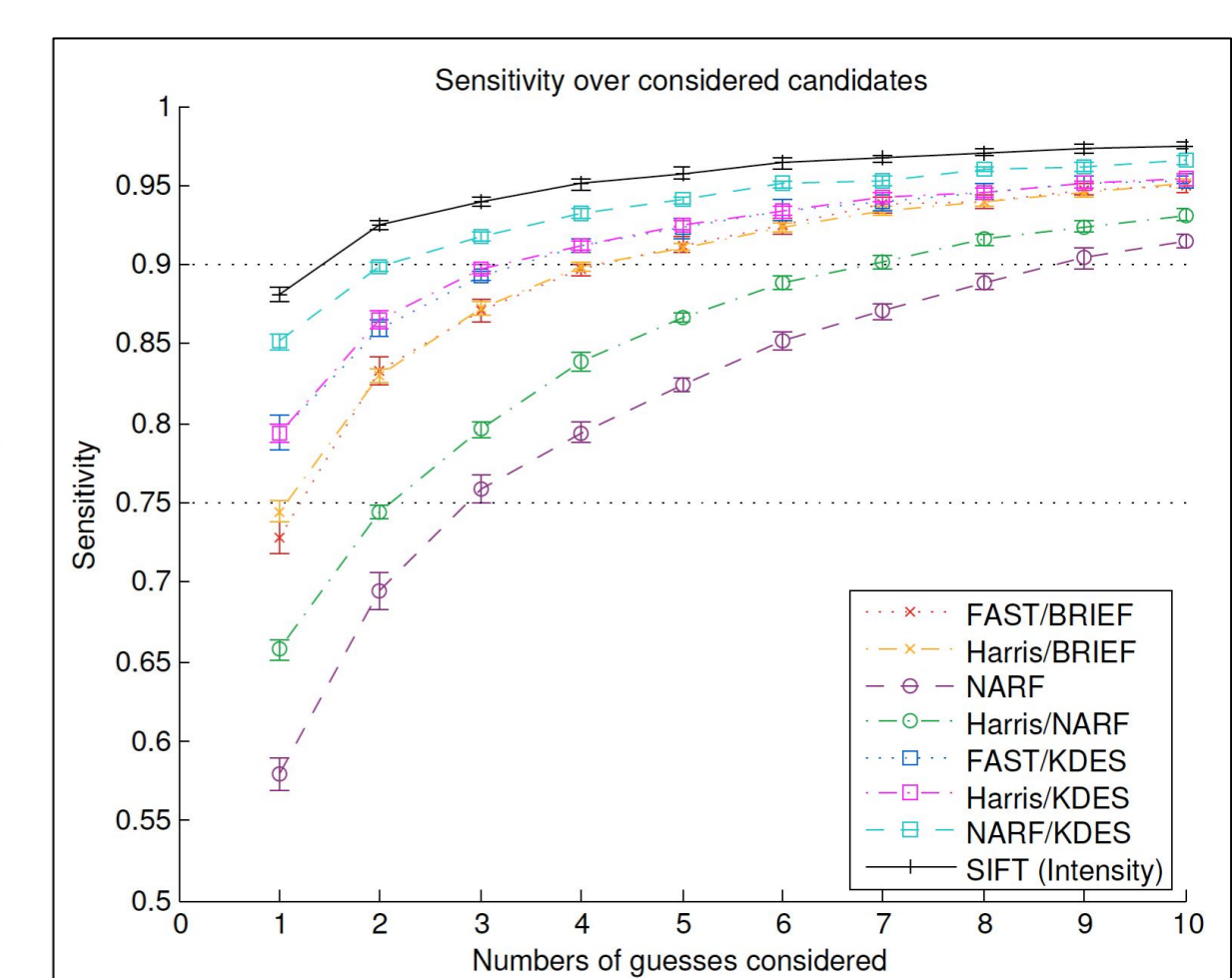
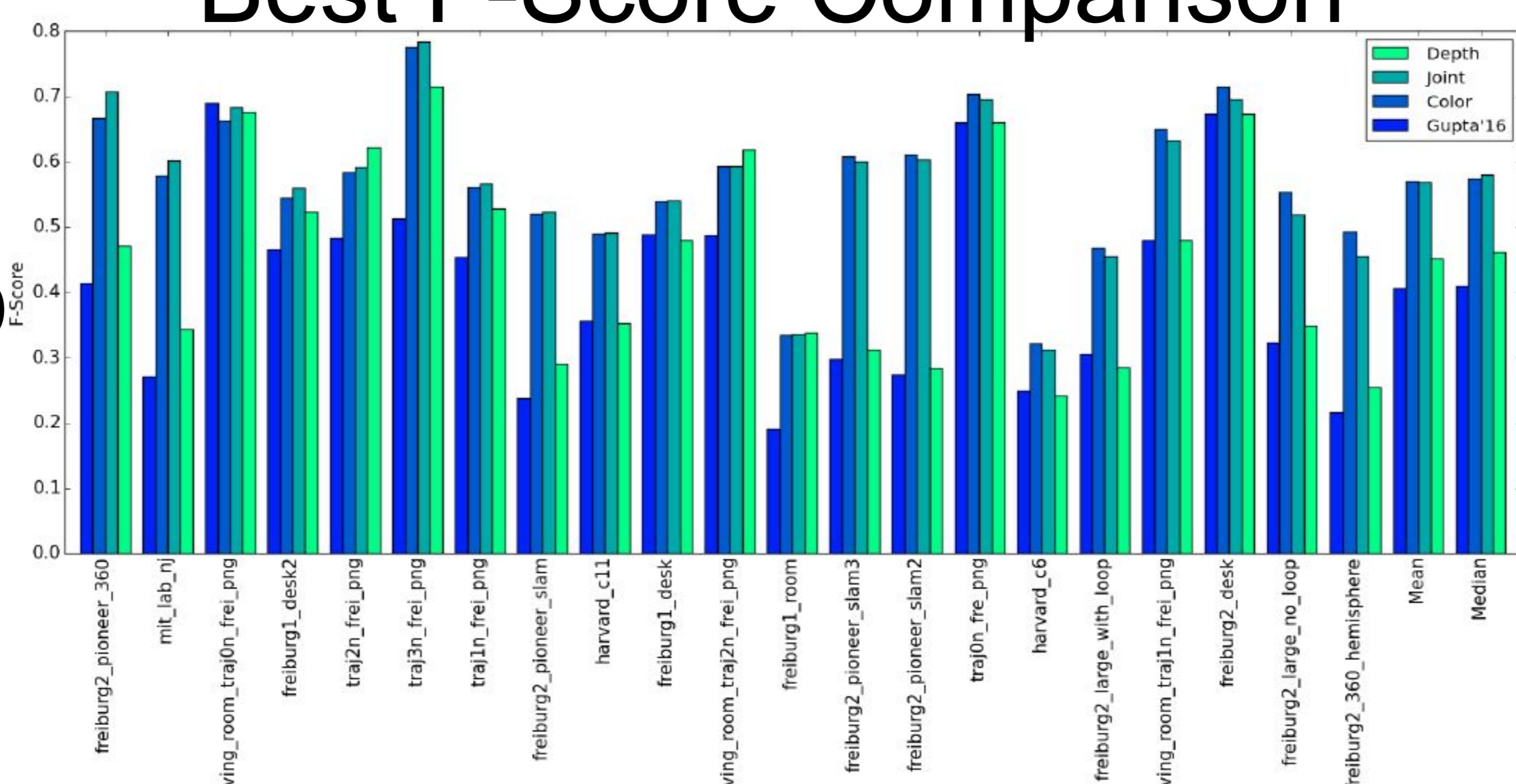
Predict 3D overlap



Evaluation

Scenes from ICL-NUIM [7], TUM RGB-D [19], and Sun3D [23] datasets

Best F-Score Comparison



← Scherer [17]