

SCHOOL OF COMPUTER AND COMMUNICATION SCIENCES

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

Computer Vision Laboratory Unseen Spacecraft Pose Estimation

Baseline solution by implementing a machine learning framework with target models included

Bachelor's Thesis in Computer Science

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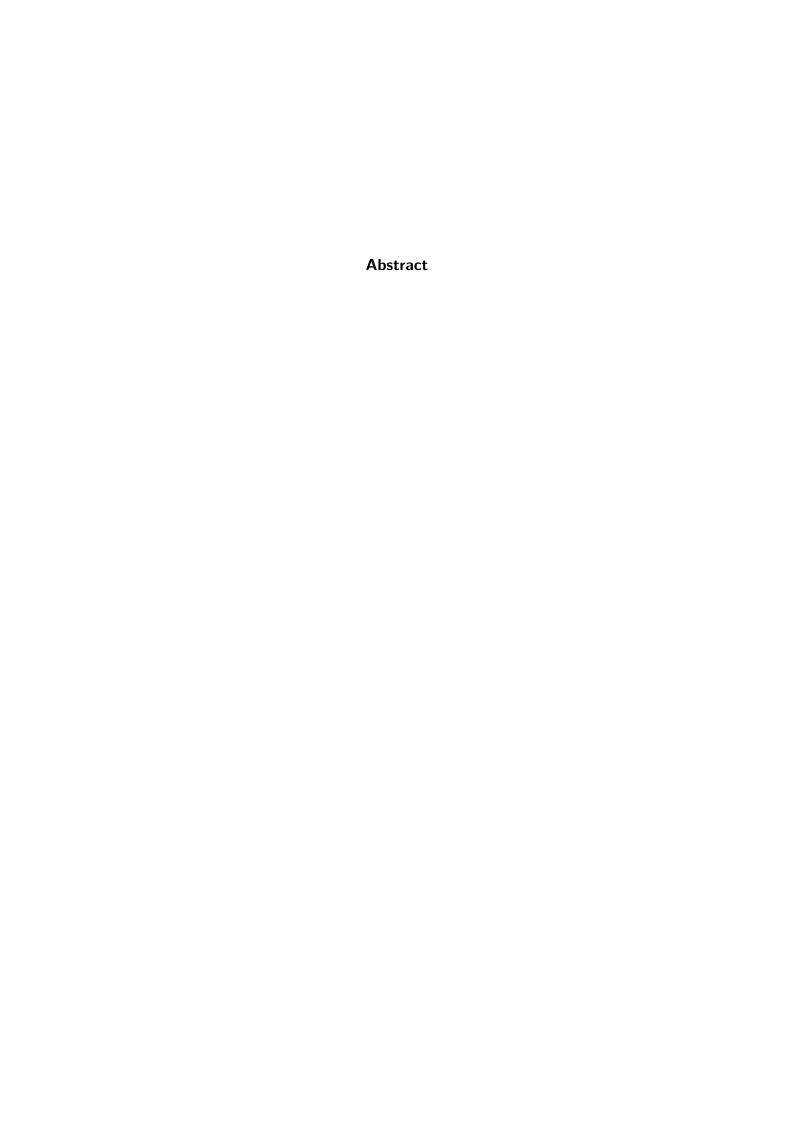
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1 Introduction

- 1.1 Problem statement
- 1.1.1 The settings
- **1.1.2** The goal
- 1.2 The work environment: Scitas Izar

2 Scientific papers review

- 2.1 Some ML models
- 2.2 Gen6D: Pros and cons

3 Gen6D: formal description

- 3.1 Overview of the network
- 3.2 Detection
- 3.3 Viewpoint selection
- 3.4 Pose refinement
- 3.5 Results on LINEMOD

4 Implementation of the model

- 4.1 Data loader
- 4.2 Issues and proposed solutions
- 4.2.1 Issues No. 1
- 4.2.2 Issues No. 2

5 Experimental results and analysis

- 5.1 Spacecraft dataset characteristics
- 5.2 Vizualisation of results
- 5.3 Evaluation metrics
- 5.4 Quantitative evaluation

6 Ways of improvements

- 6.1 Specialized spacecraft training set
- 6.2 Improved object detection algorithms

Rely more on the 3D model (for now only the size), would optimize for symmetric and irregular shaped spacecrafts

6.3 Robustness to occlusion

Conclusion

Limitations Acknowledgments My personal contribution

Abbreviations

