JIP for Underwater Inspections – 3D Model Reconstruction

Hai Gu
Oct, 2019,
Spring, TX, USA

ABS

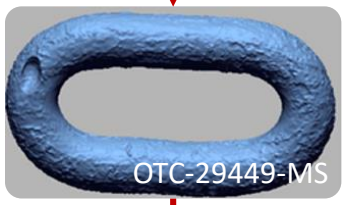
Mooring, riser, subsea facilities, and more…

3D Model Reconstruction for Underwater Inspections

Underwater inspections

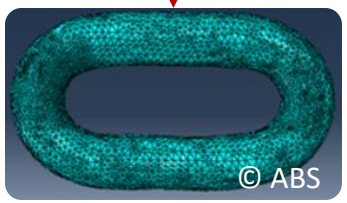
- Visual inspection
- Measurement
  - Current: Calipers
  - Emerging: **3D model reconstruction** ⇨
    - Photogrammetry
    - Laser scanning

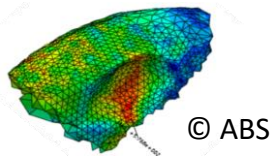
Object



3D model of the object

- Accuracy?
- Definition of accuracy?
- Methodology to assess the accuracy?





Use the model for assessments

- Method to get required data?
- Consider the accuracy of the model?
- Life extension?
- …

Objectives, Deliverables, and Scope of Work

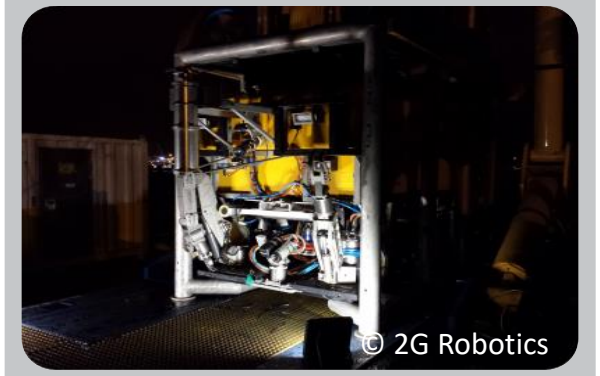
Task 1

Develop a methodology for evaluating the accuracy of 3D models

Task 2

Develop guidelines for the use of 3D models for classification-related assessments

Task 3



Develop guidelines for conducting underwater inspections using 3D reconstruction technologies

Task 4 (optional)

Deepwater Mini ROV

Develop the Accuracy Evaluation Methodology

Input

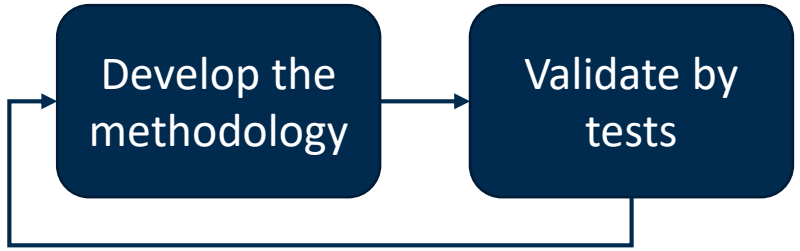
3D reconstruction technology

Accuracy evaluation methodology

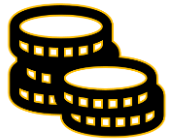
Accuracy of 3D models from the technology

Output

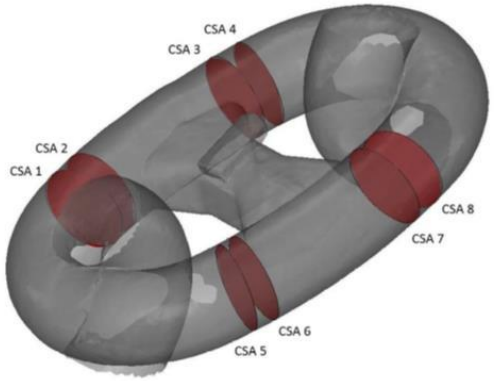
- Definition of accuracy
- Artifacts
- Standardized tests
- Data analysis methods



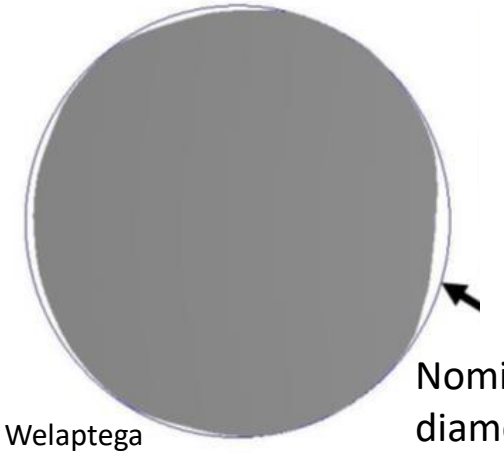
- Tank tests
- Field tests



Refine the methodology if necessary



© Welaptega



© Welaptega

Nominal chain diameter

Estimated Costs and Programs

Participants	Estimated Cost/Year (US$) Total 2 Years	Votes per participant
Oil Majors/Operators/Owners/Yards	50k (Total 100k)	4
Service Provider/Equipment Manufacturers	15k (Total 30k)	1
Class Societies/Academic Institute	5k (Total 10k)	1

- Aim for DeepStar satellite project
- Kick-off in Dec 2019

ABS Point of Contact

Dr. Hai GU
Director of Technology
American Bureau of Shipping
T: +1 (281) 877-6844
Email: hgu@eagle.org

Dr. Xi-Ying Zhang
Principal Engineer
American Bureau of Shipping
T: +1 (281) 877-5778
email: xyzhang@eagle.org

Thank You