Deliverable Reference	:	D10.10
Title	:	Archive of Test Datasets
Confidentiality Level	:	PU
Lead Partner	:	USTRATH
Abstract	:	This document describes the datasets recorded by the InFuse consortium and used to validate the InFuse components (at the time of writing)
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Project Officer EC	:	Christos Ampatzis (REA)

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DOCUMENT APPROVAL SHEET			
	Name	Organization	Date
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Executive summary

Over the course of several field test campaigns up to and including M22, the InFuse consortium has produced and collected a number of datasets that it can now use to test and validate the components of the CDFF. This document describes those datasets and mentions which components they can help test.

The datasets are currently stored on a cloud service hosted by the University of Strathclyde for use by partners. They are intended to be made available to the public after InFuse release, except for cases where dataset contents are considered restricted by the preparer or facility provider.

Contents

1 Introduction

Over the course of the project, the InFuse consortium has conducted a series of field test campaigns at CNES and DLR. The key activity during most of these campaigns was the production and collection of representative sensor datasets for input to the CDFF components under development, so that performance can be established and improvements made. These sensor datasets represent a valuable resource, both as a reference of realistic situations for validation of the CDFF and as a means by which future improvements to the CDFF can be evaluated with respect to the current state of the art.

As such, these datasets have been centrally located for the duration of the InFuse project on secure cloud facilities known as "StrathCloud[1]" that are physically located at the University of Strathclyde in Glasgow, UK using ShareFile hosting software. As the intent is to publicly release the datasets that are not restricted in nature alongside the CDFF source code for future benefit to the space and robotics communities, a permanent public hosting provider is currently being sought to provide this future availability.

1.1 Purpose

This document describes the datasets developed within the scope of all InFuse WPs until M22.

1.2 Structure

This document is structured as follows:

Section 1	This introductory matter
Section 2	Description of the datasets, with mention of the related CDFF components
Section 3	Conclusion

1.3 Applicable documents

AD1	InFuse Grant Agreement
AD2	InFuse Consortium Agreement
AD3	InFuse Internal Management Manual for project partners

1.4 Reference documents

RD1	Description of Action document

1.5 Acronyms

BB2: See XMBB2
CDFF: Common Data Fusion Framework
DEM: Digital Elevation Map
DFN: Data Fusion Node
DFPC: Data Fusion Processing Compound
HCRU: Handheld Central Rover Unit
OOS-SIM: On-Orbit Servicer Simulator (an orbital facility at DLR)
OT: Orbital Track
PEL: Planetary Exploration Laboratory (a planetary facility at DLR)

[1] https://strathcloud.sharefile.eu

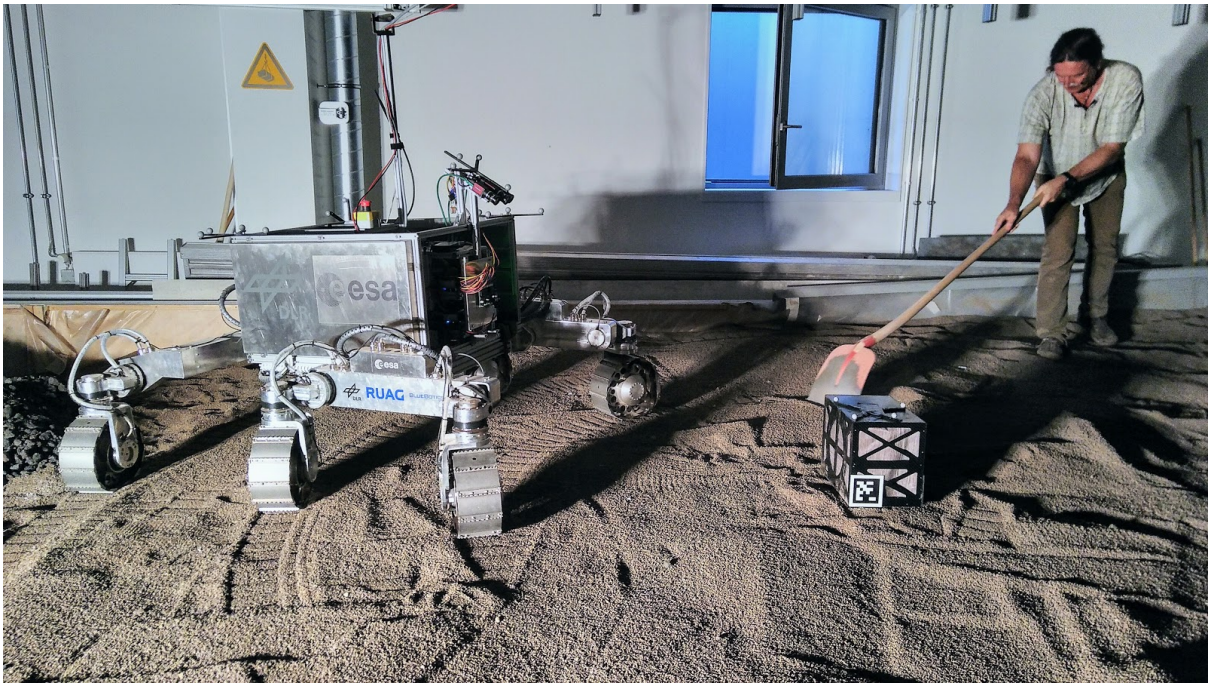
PT: Planetary Track
RI: Reference Implementation
SEROM: Site d'Essai pour les Rovers Mobiles (aka MarsYard, a planetary facility at CNES)
XMBB2: ExoMars Bread-Board 2 (a prototype of the ExoMars rover, hosted in PEL at DLR)

2 Datasets

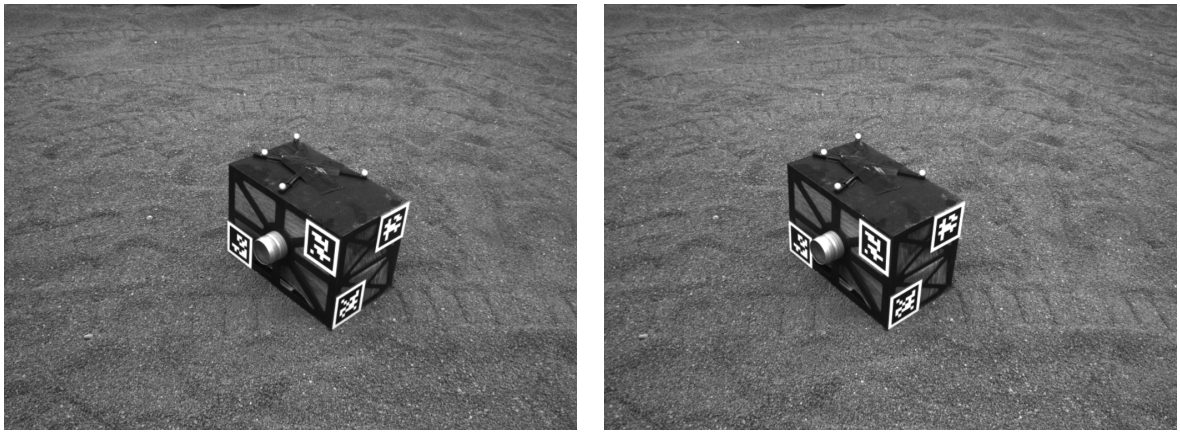
2.1 PT - PEL - 3D reconstruction of an object from stereo images

Short description	Multiple viewpoints of an object lying on the ground
Orbital or Planetary	PT
Date	2018-07-24 and 2018-07-26
Facility	PEL
Partners involved in collection	DLR, USTRATH
Location on StrathCloud	2016_MP_InFuse/DLR/PEL/XMBB2 - Multiple Viewpoints of an Object
Confidentiality restrictions	NONE
Long description	This dataset was generated to test the 3D target reconstruction DFPC on data representative of a planetary exploration mission, where a rover would have to generate a 3D model of an object (its lander or a rock of interest, for instance) from the images of its stereo cameras. The BB2 rover is driven in a circular, constant-velocity motion around a box laying on the ground. Its stereo cameras are pointed at the box. The recorded ROS topics include the stereo images, camera parameters, absolute poses of the box and the left camera, depth image, wheel odometry, inertial measurements, tf tree.

Filename	Description	Related CDFF components
20180724-135036	Lightning conditions: fluorescent ceiling lights	Reconstruction3D
20180724-140214	Lightning conditions: fluorescent ceiling lights	Reconstruction3D
20180724-142348	Lightning conditions: four yellowish low-elevation spotlights that cast long shadows on the ground, put on the same mount, at waist level	Reconstruction3D
20180726-132908	Lightning conditions: fluorescent ceiling lights Additional recorded data: lidar point cloud	Reconstruction3D
20180726-134316	Lightning conditions: four yellowish low-elevation spotlights that cast long shadows on the ground, put on the same mount, at waist level Additional recorded data: lidar point cloud	Reconstruction3D
README.md	Detail of experimental conditions (notes)	N/A
README.d	Detail of experimental conditions (photos)	N/A



BB2 rover with HCRU unit looking at the target of the 3D reconstruction and
DLR roboticist preparing the ground before data acquisition



Sample of recorded data: a stereo image pair
from the rover's stereo cameras

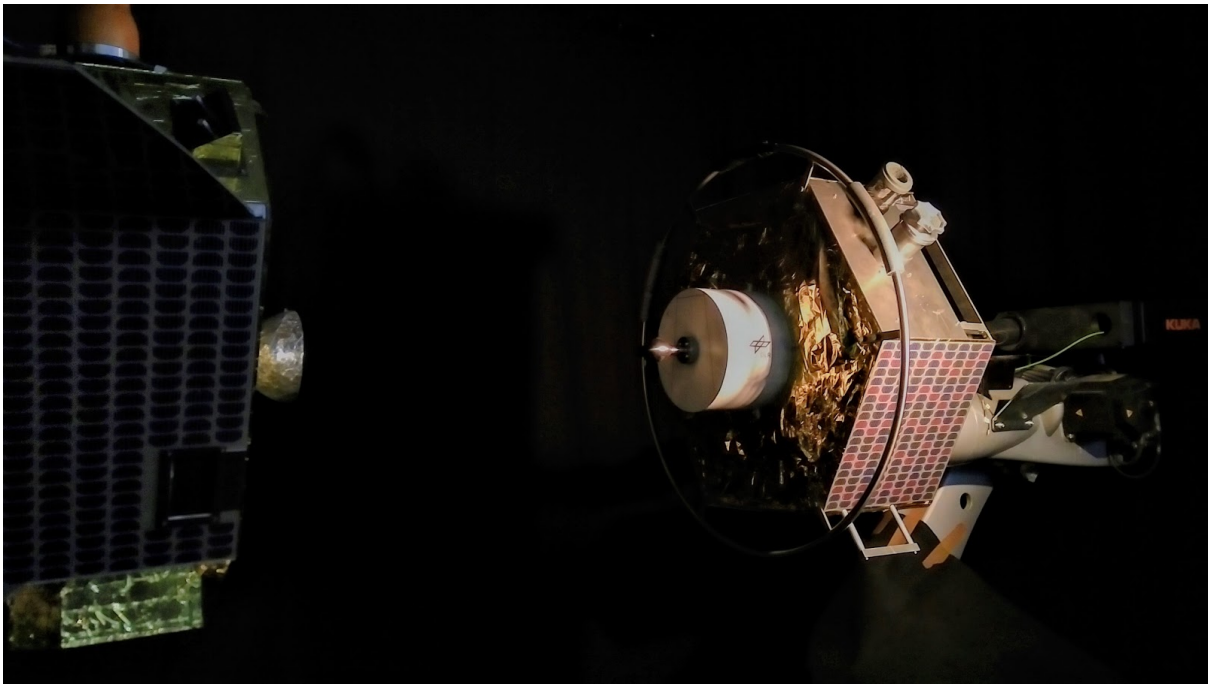
2.2 OT - OOS-SIM - 3D reconstruction of a satellite from stereo images

Short description	Multiple viewpoints of a satellite in motion
Orbital or Planetary	OT
Date	2018-09-13
Facility	OOS-SIM

Partners involved in collection	DLR, USTRATH
Location on StrathCloud	Post-processing of this dataset in progress Dataset coming soon in 2016_MP_InFuse/DLR/OOS-SIM/20180913
Confidentiality restrictions	NONE
Long description	This dataset was generated to test the 3D target reconstruction DFPC on data representative of an on-orbit satellite servicing mission, where a servicer spacecraft would have to generate a 3D model of the target satellite from the images of its stereo cameras. In the OOS-SIM facility, the satellite mockup is controlled to execute three low-speed, constant-velocity motions: two rotations and one translation. The servicer mockup stands in front of the satellite and doesn't move. Its stereo cameras are pointed at the satellite. The recorded data includes the stereo images, camera parameters, geometric transformations between the various coordinate frames, lidar point cloud. In the table below, the satellite's x axis is its main axis of symmetry, going through its center and its docking attachment; its y axis is more or less aligned with the scene's vertical; and its z axis completes the orthonormal frame. Lightning conditions are as follow: Eclipse: the scene's spotlight is switched off and the servicer's onboard spotlight is switched on, it is a white-light spotlight mounted right above the stereo cameras. Low-light from the side: the onboard spotlight is switched off and the scene's spotlight is switched on, it is located about two meters off the side of the satellite, and illuminates that side in a weak yellow light. Low-light from the front: the onboard spotlight is switched off and the scene's spotlight is switched on, it is located about two meters off the side and in front of the satellite, and illuminates it in a weak yellow light.

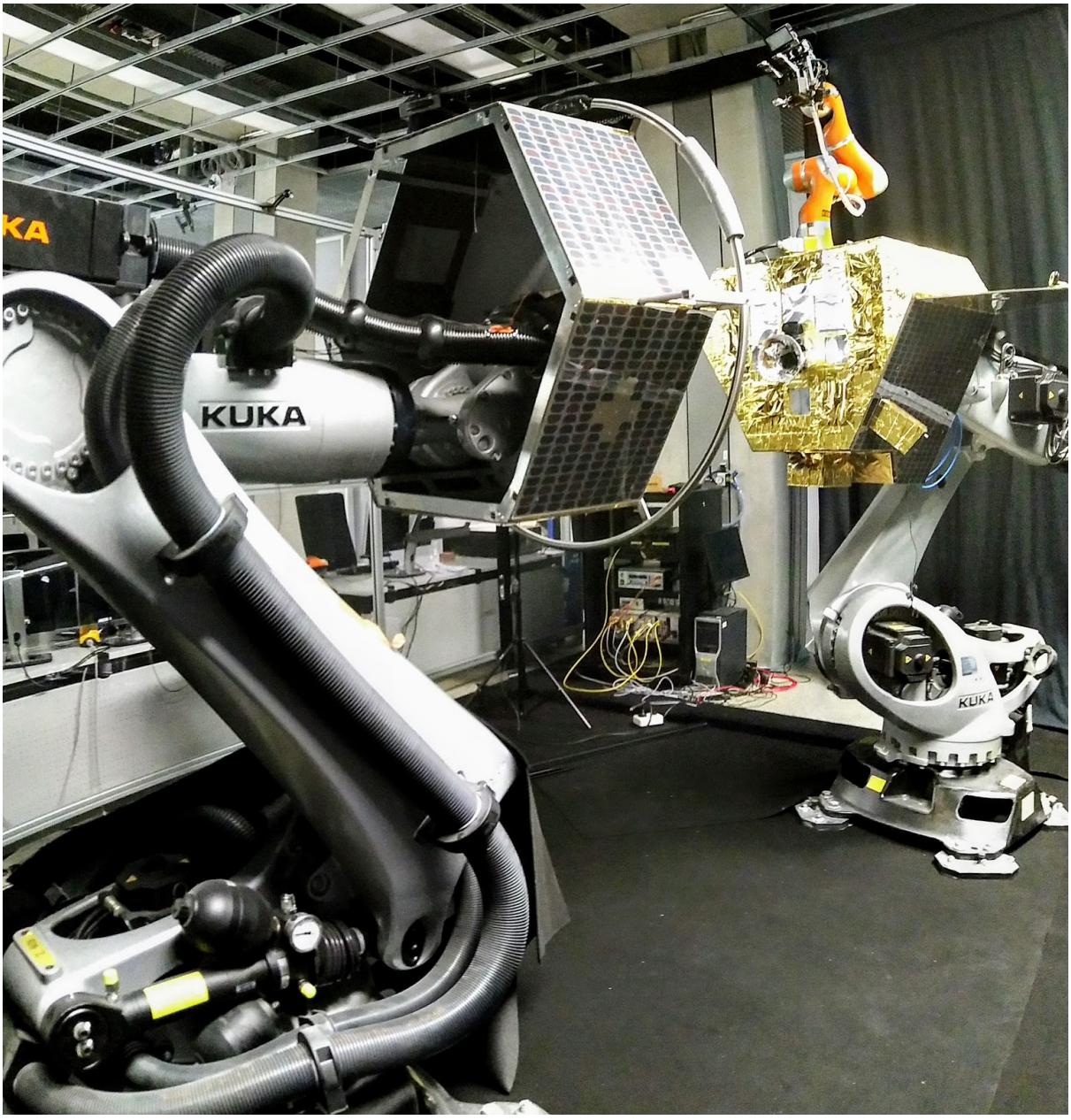
Filename	Description	Related CDFF components
TBC	Satellite motion: rotation about its x axis Lightning conditions: eclipse	Reconstruction3D
TBC	Satellite motion: rotation about its y axis Lightning conditions: eclipse	Reconstruction3D
TBC	Satellite motion: translation in its yz plane Lightning conditions: eclipse	Reconstruction3D
TBC	Satellite motion: translation in its yz plane Lightning conditions: low-light from the side	Reconstruction3D
TBC	Satellite motion: rotation about its y axis	Reconstruction3D

	Lightning conditions: low-light from the side	
TBC	Satellite motion: rotation about its x axis Lightning conditions: low-light from the side	Reconstruction3D
TBC	Satellite motion: translation in its yz plane Lightning conditions: low-light from the front	Reconstruction3D
TBC	Satellite motion: rotation about its y axis Lightning conditions: low-light from the front	Reconstruction3D
TBC	Satellite motion: rotation about its x axis Lightning conditions: low-light from the front	Reconstruction3D
README.md	Detail of experimental conditions (notes)	N/A
README.d	Detail of experimental conditions (photos)	N/A

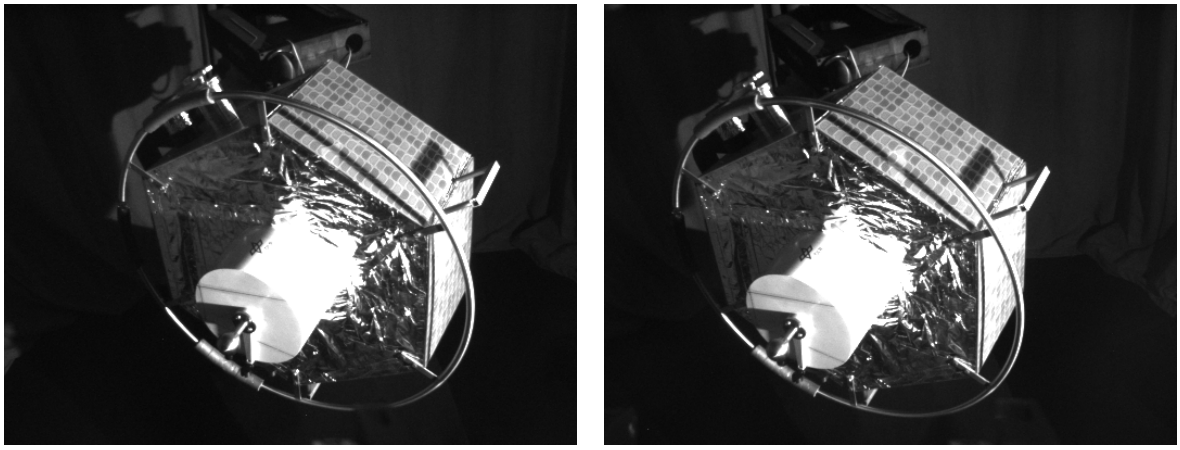


Target satellite during dataset acquisition in low illumination
from the side (the servicer is on the left)

DLR roboticist at the control computer, double-checking
that the required data was correctly recorded



General view of the OOS-SIM facility: satellite mockup on the left-hand side, servicer spacecraft mockup on the right-hand side, onboard spotlight visible at the very top of the lightweight manipulator mounted on the servicer



Sample of recorded data: a stereo image pair
from the servicer's cameras

2.3 PT - PEL - BB2 navigation with sand and rocks

Short description	Navigational data from various trajectories of movement of BB2
Orbital or Planetary	PT
Date	2018-07-26 and 2018-07-27
Facility	PEL
Partners involved in collection	DLR, MAG
Location on StrathCloud	2016_MP_InFuse/DLR/PEL/XMBB2 - Campaign1-July2018-MAG
Confidentiality restrictions	NONE
Long description	Recorded sensor data is stored as ROS bags from driving a variety of trajectories in the PEL sandbox with rocks and other obstacles present

Filename	Description	Applicable scenarios
20180726-144835	Back and forth in PEL, with 2x 180° turn in place. Flat surface, very few rocks. Full intensity lab lighting.	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM
20180726-150342	Back and forth in PEL, with 2x 180° turn in place. Flat surface, very few rocks. Floodlights in -X direction.	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM
20180726-153855	Back and forth in PEL, with 2x 180° turn in place. Flat surface, very few rocks. Floodlights in +Y direction.	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM
20180726-164023	Back and forth in PEL, with 2x 180° turn in place.	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM

	Flat surface, some craters and large amount of rocks. Full intensity lab lighting.	
20180726-165912	Back and forth in PEL, with 2x 180° turn in place. Flat surface, some craters and large amount of rocks. Floodlights in +Y direction	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM
20180726-173654	Back and forth in PEL, with 1x 180° turn in place. On very rough terrain. Flat surface, some craters and large amount of rocks. Floodlights in +Y direction	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM
20180727-101412	Back and forth in PEL, with 1x 180° turn in place. On very rough terrain. Flat surface, some craters and large amount of rocks. Floodlights in -X direction	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM
20180727-104821	Start in center of PEL, drive up the slope, and back to center. Slope at 13°, some craters and large amount of rocks. Floodlights in +Y direction.	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM
20180727-135115	Start in center of PEL, drive up the slope, and back to center. Slope at 13°, some craters and large amount of rocks. Floodlights in +X direction.	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM
20180727-144232	Start in center of PEL and drive towards Payload Box, on the slope. Slope at 13°, some craters and large amount of rocks. Full intensity lab lighting.	RI-INFUSE-RENDEZVOUS
20180727-145249	Start in center of PEL and drive towards Payload Box, on the slope. Slope at 13°, some craters and large amount of rocks. Floodlights in +X direction.	RI-INFUSE-RENDEZVOUS
runs.md	Detail of experimental conditions	N/A

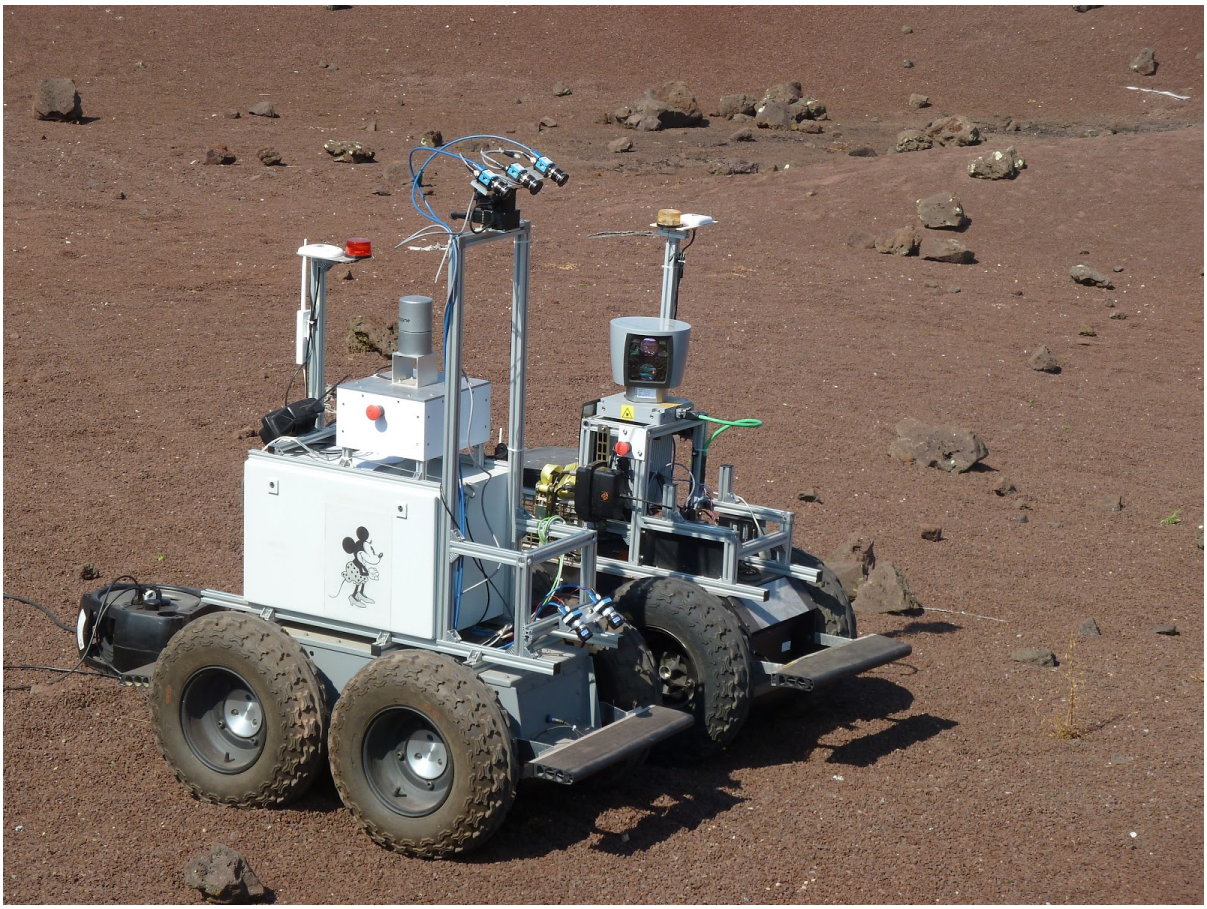
2.4 PT - SEROM - Outdoor navigation using Mana and Minnie

Short description	Test campaign at SEROM of outdoor navigation with Mana and Minnie
Orbital or Planetary	PT
Date	2018-08-31 to 2018-09-05

Facility	SEROM
Partners involved in collection	LAAS, MAG
Location on StrathCloud	2016_MP_InFuse/CNES/Datasets/Minnie-Campaign1-August2018 2016_MP_InFuse/CNES/Datasets/Mana-Campaign1-August2018
Confidentiality restrictions	Distribution limited by CNES to within the InFuse consortium
Long description	Recordings in ROS bag format of outdoor navigation test campaign at CNES' SEROM facility using LAAS' Mana and Minnie rovers

Filename	Description	Applicable scenarios
CNES-minnie_replay_20180831_secondbag	Loop through SEROM, PTU tilted -0.61rad, max linear velocity 0.2m/s and 0.4m/s in the last 20 meters of the path, max angular velocity 0.5rad/s, camera triggered at 2Hz, recording a stereo pair for both stereo benches	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM RI-INFUSE-RETURN-TO-BASE
CNES-minnie_replay_20180831_thirdbag	Loop through SEROM, PTU tilted -0.61rad, max linear velocity 0.3m/s, max angular velocity 0.5rad/s, camera triggered at 2Hz, recording a stereo pair for both stereo benches	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM RI-INFUSE-RETURN-TO-BASE
CNES-minnie_replay1_traj1	Loop through SEROM, PTU tilted -0.61rad, max linear velocity 0.3m/s, max angular velocity 0.5rad/s, camera triggered at 2Hz, recording a stereo pair for both stereo benches	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM RI-INFUSE-RETURN-TO-BASE
CNES-minnie_replay_traj1	Loop through SEROM, PTU tilted -0.61rad, max linear velocity 0.3m/s, max angular velocity 0.5rad/s, camera triggered at 2Hz, recording a stereo pair for both stereo benches	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM RI-INFUSE-RETURN-TO-BASE
CNES-minnie_replay_20180904_traj1	Loop through SEROM, PTU tilted -0.61rad, max linear velocity 0.3m/s, max angular velocity 0.5rad/s, camera triggered at 2Hz, recording left and right images separately	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM RI-INFUSE-RETURN-TO-BASE
CNES-minnie_replay2_20180904_traj1	Loop through SEROM, Minnie follows Mana, PTU tilted -0.61rad, max linear velocity 0.3m/s, max angular velocity 0.5rad/s, camera triggered at 2Hz, recording left and right images separately, NavCam not synchronized use FrontCam instead	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM RI-INFUSE-RENDEZVOUS RI-INFUSE-RETURN-TO-BASE
CNES-minnie_replay_reverse_20180904_traj1	Back and forth in SEROM, PTU tilted -0.61rad, max linear velocity 0.3m/s, max angular velocity 0.5rad/s, camera triggered at 2Hz, recording left and right images separately, NavCam not synchronized use FrontCam instead	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM RI-INFUSE-RETURN-TO-BASE
CNES-mana_replay_reverse_20180904_traj1	Back and forth in SEROM, PTU tilted -0.61rad, max linear velocity 0.3m/s, max angular velocity 0.5rad/s, lidar triggered at 0.5Hz	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM RI-INFUSE-RETURN-TO-BASE

CNES-mana_replay2_20180904_traj1	Loop through SEROM, Minnie follows Mana, PTU tilted -0.61rad, max linear velocity 0.3m/s, max angular velocity 0.5rad/s, lidar triggered at 0.5Hz	RI-INFUSE-LONG-TRAVERSE-LOC RI-INFUSE-LONG-TRAVERSE-DEM RI-INFUSE-RENDEZVOUS RI-INFUSE-RETURN-TO-BASE



Mana (right) and Minnie (left) on the SEROM test field

2.5 PT - PEL - BB2 external views of objects

Short description	External views of the BB2 rover
Orbital or Planetary	PT
Date	2018-07-23
Facility	PEL
Partners involved in collection	DLR, SPACEAPPS
Location on StrathCloud	2016_MP_InFuse/DLR/PEL/XMBB2 - External Views
Confidentiality restrictions	NONE

Long description	Images of BB2 performing simple motions captured by a static camera. The bags provide the position of a marker on top of the camera (± 3cm accuracy), the camera images, and the measured pose of the rover.

Filename	Description	Related CDFF components
2018-07-23-16-15-51-laptop-position	Dummy bag file providing the pose of the marker placed above the camera (`/art_single_body` topic).	
2018-07-23-16-21-00-xmbb2-circle	Video sequence showing the rover turning in a circle in front of the camera (`/art_single_body` topic for rover pose, `/lappycam/image_raw` topic for images of the rover).	Edge Detection, Background Extraction
2018-07-23-16-46-39-0_deg	Video sequence showing the rover driving head on at the camera (`/art_single_body` topic for rover pose, `/lappycam/image_raw` topic for images of the rover).	
2018-07-23-16-53-20-45_deg	Video sequence showing the rover towards the camera at a 45° angle (`/art_single_body` topic for rover pose, `/lappycam/image_raw` topic for images of the rover).	
2018-07-23-16-58-17-135_deg	Video sequence showing the rover turning in a circle in front of the camera (`/art_single_body` topic for rover pose, `/lappycam/image_raw` topic for images of the rover).	

Views of the BB2 rover, from the xmbb2-circle dataset

2.6 PT - PEL - Demonstration of Tokamak

Short description	Tokamak running on XMBB2 rover
Orbital or Planetary	PT
Date	2018-09-12
Facility	PEL
Partners involved in collection	LAAS, DLR, SPACEAPPS
Location on StrathCloud	DLR/PEL datasets/XMBB2 - TOKAMAK

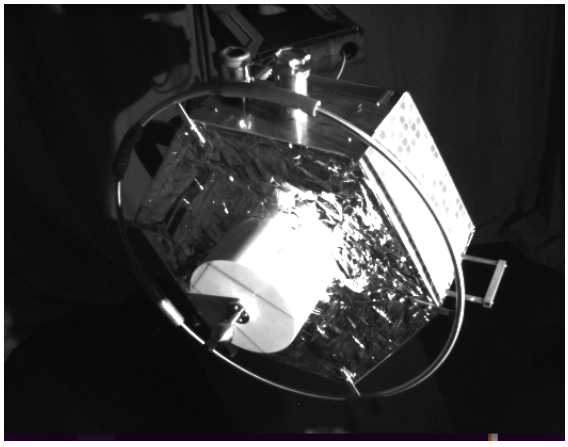
Confidentiality restrictions	NONE
Long description	This datasets contains rosbags concerning the use of Tokamak (Pose Manager) on DLR's HCRU. Each bag contains the input ground truth (motion capture of the robot), input fused wheel and visual odometry, and output pose given out by the Pose Manager. Three scenario are available: the robot driving in a straight line, the robot doing a few turns in the sand, and the robot doing a full rotation on itself.

Filename	Description	Related CDFF components
DLR_acquisition_20180912.bag	Robot driving in straight line in PEL	Pose Manager
DLR_acquisition_20180912_uturn.bag	Robot turning inside PEL	Pose Manager
DLR_acquisition_20180912_rotation.bag	Robot rotating on itself in PEL	Pose Manager

2.7 OT - OOS-SIM - Short-range detection and tracking

Short description	Detection and tracking of a target satellite
Orbital or Planetary	OT
Date	2018-09-14
Facility	OOS-SIM
Partners involved in collection	DLR, SPACEAPPS
Location on StrathCloud	Post-processing of this dataset in progress Dataset coming soon in 2016_MP_InFuse/DLR/OOS-SIM/20180913
Confidentiality restrictions	NONE
Long description	Docking approach of the servicer spacecraft (aka chaser) in two different scenarios: translation of the servicer alone, and translation of the servicer together with rotation of the target satellite. There are three different lighting conditions, for a total of six cases. An additional scenario is done : rotation of the servicer alone on the vertical axis to orientate it to the target, and translation of the servicer once the target is in the field of view. The dataset consists of: - Stereo B&W images in PGM format - Camera calibration information in TXT file - Pose trajectory (ground truth) - Depth images (generated offline with DepthMapComputation DFN) The dataset is useful in OT detection and tracking performance tests, to illustrate how stable the estimation errors are with respect to target motion and lightning conditions.

Filename	Description	Related CDFF components
TBC	Translation approach, target illuminated from the back (sunlight)	DetectionAndTracking
TBC	Translation approach, target illuminated from the front (sunlight)	DetectionAndTracking
TBC	Translation approach, target illuminated by the chaser's onboard LED spotlight (eclipse)	DetectionAndTracking
TBC x 3	Same as above with rotation of the target added	DetectionAndTracking
TBC	Translation approach, chaser aligns the satellite in the FOV first, target illuminated from the front (sunlight)	DetectionAndTracking
README	Detail of experimental conditions	N/A



Target satellite seen by the servicer's cameras during docking approach

2.8 PT - PEL - Wheel detection and tracking

Short description	Detection and tracking of a wheeled BB2 structure
Orbital or Planetary	PT
Date	2018-09-10 to 2018-09-14
Facility	PEL
Partners involved in collection	DLR, SPACEAPPS
Location on StrathCloud	2016_MP_InFuse/DLR/PEL/XMBB2 - Wheel Tracking
Confidentiality restrictions	NONE
Long description	BB2 is driven over rocks to adjust its HazCams' field of view. A wheeled

	structure is manually brought into the field of view. The target structure, seen from the side, moves with a translation motion, and is partly occluded by rocks in its trajectory. This unique scenario is executed in four different lightning conditions: indoor lights produced by the fluorescent ceiling tubes, low sunlight simulated by a pair of spotlights at a height of 1 m, zenith sunlight simulated by two pairs of spotlights at a height of 2 m, and nighttime, with illumination of the target coming from LEDs mounted on BB2. The dataset consists in ROSbags that include: - Stereo B&W images - Depth images - BB2 pose (unused) - BB2 tf tree (unused) The dataset is useful in PT detection and tracking performance tests, to illustrate how stable the estimation errors are with respect to lightning conditions and type of shadows. Other wheel movements would be necessary for more extensive evaluation. Note: no available ground truth.

Filename	Description	Related CDFF components
2018-09-13-14-06-34-wheel-indoor-neon-lights	Wheel in motion under indoor ceiling lights. Presence of occlusions.	DetectionAndTracking
2018-09-13-14-12-01-wheel-low-lights	Wheel in motion under lab-created low sunlight conditions. Presence of shadows and occlusions.	DetectionAndTracking
2018-09-13-14-18-43-wheel-zenith-lights	Wheel in motion under lab-created zenith sunlight conditions. Presence of shadows and occlusions.	DetectionAndTracking
2018-09-13-14-50-34-wheel-night-led-lights	Wheel in motion under lab-created nighttime conditions, with illumination coming from LEDs mounted on BB2. Presence of shadows and occlusions.	DetectionAndTracking
README	Detail of experimental conditions	N/A

Left: HCRU's view of target in low spotlights setup
Right: same scenario in the dark with LED lights

2.9 PT - SEROM - Outdoor rover detection and tracking

Short description	Detection and tracking of the Mana rover by HCRU
Orbital or Planetary	PT
Date	2018-06-25/28 2018-08-29
Facility	SEROM
Partners involved in collection	DLR, LAAS, SPACEAPPS
Location on StrathCloud	2016_MP_InFuse/CNES/Minnie-To-Mana-August-2018 2016_MP_InFuse/CNES/HCRU
Confidentiality restrictions	Yes. CNES fences can not be shown (ask Simon's confirmation).
Long description	Minnie OR HCRU visualizes Mana moving. Minnie is either static or chasing Mana. The dataset consists of ROS bags. the ones recorded by HCRU output ROS msgs, while the others (recorded by Minnie) output ASN.1 msg types. They consist in : - stereo rectified b&w images - camera calibration information - depth images (on HCRU only) - detected Harris corners (on HCRU only) The dataset is useful in the elaboration of PT detection and tracking performance tests, illustrating how stable the estimation errors are with respect to terrain conditions, vehicle orientation and trajectories. NOTE : no available ground truth.

Filename	Description	Related CDFF components
recording_20180626-1	HCRU visualizes Mana, which enters and then quits the	DetectionAndTracking

62135.bag	FOV. Half of the path is illuminated.	
recording_20180626-164527.bag recording_20180626-164931.bag	HCRU visualizes Mana and a human at the same time. They both enter and then quit the FOV, by borrowing the same path, at different speeds. The path is illuminated. Human occludes Mana at some point.	DetectionAndTracking
2018-08-29-11-37-46_0-Minnie-Static-To-Mana-Ring.bag	Minnie is static and looks at Mana who rides along a circular path. Mana is partly occluded during its trajectory.	DetectionAndTracking
2018-08-29-13-49-43-Minnie-Static-To-Mana-Trail-2.bag	Minnie is static and looks at Mana who rides along the path. Mana enters and quit the FOV, and is visually marked by an AruCo.	DetectionAndTracking
2018-08-29-13-30-11-Minnie-Dynamic-To-Mana-Chase.bag	Minnie chases Mana. They ride along the pre-built paths surrounded by rocks. Mana is visually marked by an AruCo.	DetectionAndTracking
README	Detail of experimental conditions	N/A

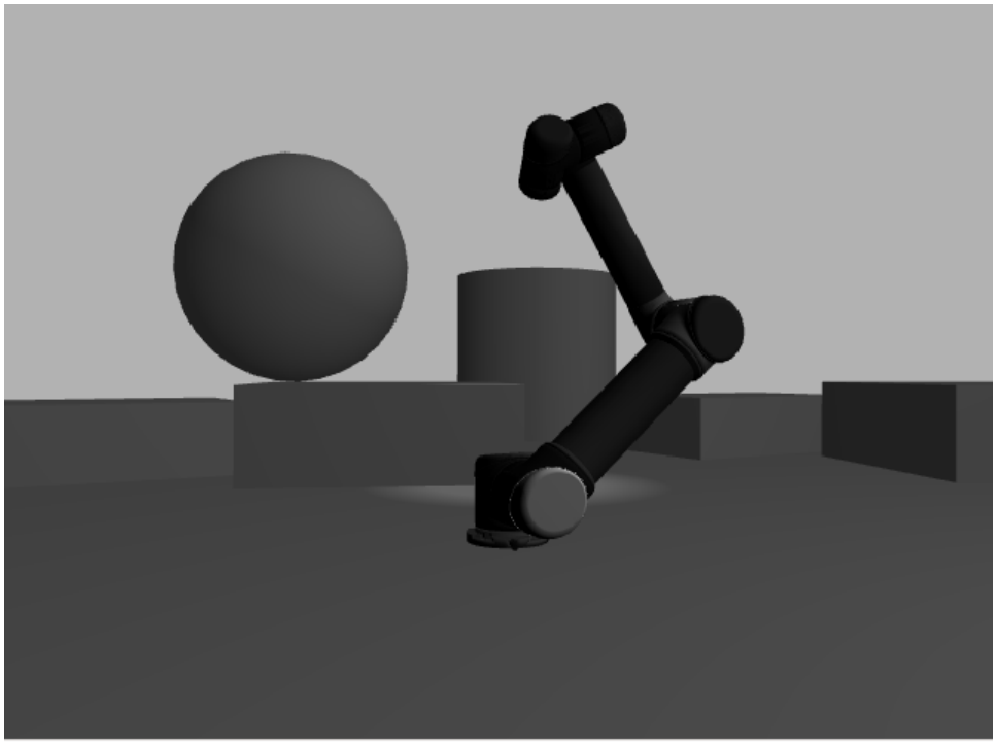
Left: Stationary HCRU recording a moving Mana rover
Right: Minnie chasing Mana

2.10 PT/OT - ROS Gazebo (synthetic) - Chain fitting

Short description	Chain fitting of a UR5 robotic arm
Orbital or Planetary	PT/OT
Date	2018-08-01
Facility	ROS Gazebo (simulated environment)
Partners involved in collection	SPACEAPPS
Location on StrathCloud	2016_MP_InFuse /Gazebo/Kinematic chain datasets/Datasets
Confidentiality restrictions	NONE

Long description	Dataset simulated in a Gazebo environment, consisting of a Kinect camera visualizing an Universal Robot UR5 arm in motion. The arm's motions are executed in a stop-and-go fashion. The Kinect camera stays stationary. The background includes primitive shapes (cubes, spheres, cylinders). - Stereo color and B&W images - Depth images - Pose of the UR5 arm The dataset is useful for kinematic chain detection, fitting, and tracking. It could be used to perform performance tests providing estimation errors, but the results may differ from real-life cases as the dataset is synthetic. More representative evaluation would require non-simulated datasets. Note: the simulated character of this dataset implies that the parameters of the related DFPC must be tuned accordingly.

Filename	Description	Related CDFF components
kinect_viz_UR5_moving.bag	Kinect view of the robotic arm in motion. Synthetic object primitives in the background.	DetectionAndTracking
README	Detail of experimental conditions	N/A



Kinect view of UR5 in ROS Gazebo simulation

3 Conclusion

This document has documented the datasets produced and collected during the InFuse consortium's field test campaign activities, which are now used to test and validate CDFF components.

The datasets remain a valuable resource for CDFF developers and users, and preparation is underway to host them on a permanent Internet server accessible from the GitHub InFuse hosting, for access by all future CDFF users.