3D-RECON

Novel 3D Reconstruction Methods for 3D Models from Camera Shoots

Pro²Future

Andreas Kuhn[2], Christian Sormann[3], Mattia Rossi[2,4], Oliver Erdler[2], Friedrich Fraundorfer[3], Michael Haslgrübler[1]

Pro2Future GmbH[1], Sony Europe B.V. – Stuttgart Technology Center[2], TUG-CGV (Institute of Computer Graphics and Vision)[3], Ecole Polytechnique Federale de Lausanne[4]

[1] Pro2Future GmbH, Altenberger Strasse 69, 4040 Linz

[2] Stuttgart Technology Center, Hedelfinger Straße 61, 70327 Stuttgart, Deutschland

[3] Graz University of Technology, Inffeldgasse 16, 8010 Graz, Österreich

[4] Lausanne, EPFL STI IEL LTS4, ELD 241 (Bâtiment ELD), Station 11, CH-1015 Lausanne

MOTIVATION & GOALS

The goal is the **analysis, development and evaluation** from methods for high quality **3D reconstructions methods** by making use of **semantic information** and modern **machine learning methods**.

- Data driven Multi-View Stereo
  - View synthesis for Multi-View Stereo (MVS)
  - MVS without cost-volumne
  - Semantic (planar) bias for depth completion
- Data driven Structure-From-Motion

Project FactBox

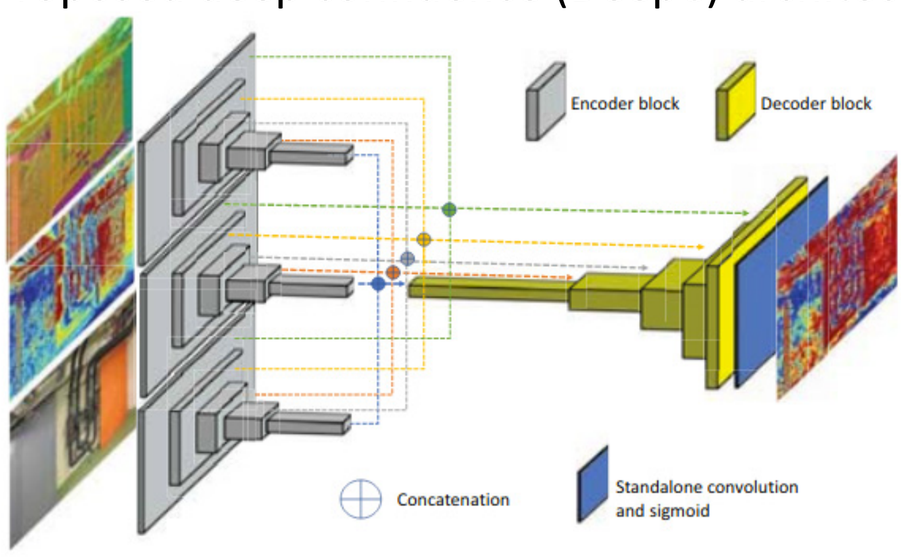
Project Name 3D-Recon III
Project ID MFP II 1.1
Duration 12 Months

Area 1
Perception and Aware Systems

Project Lead
Ass.-Prof. Dr. Fraundorfer
DI Michael Haslgrübler

METHOD

Proposed deep confidence (DeepC) architecture



CONTRIBUTION

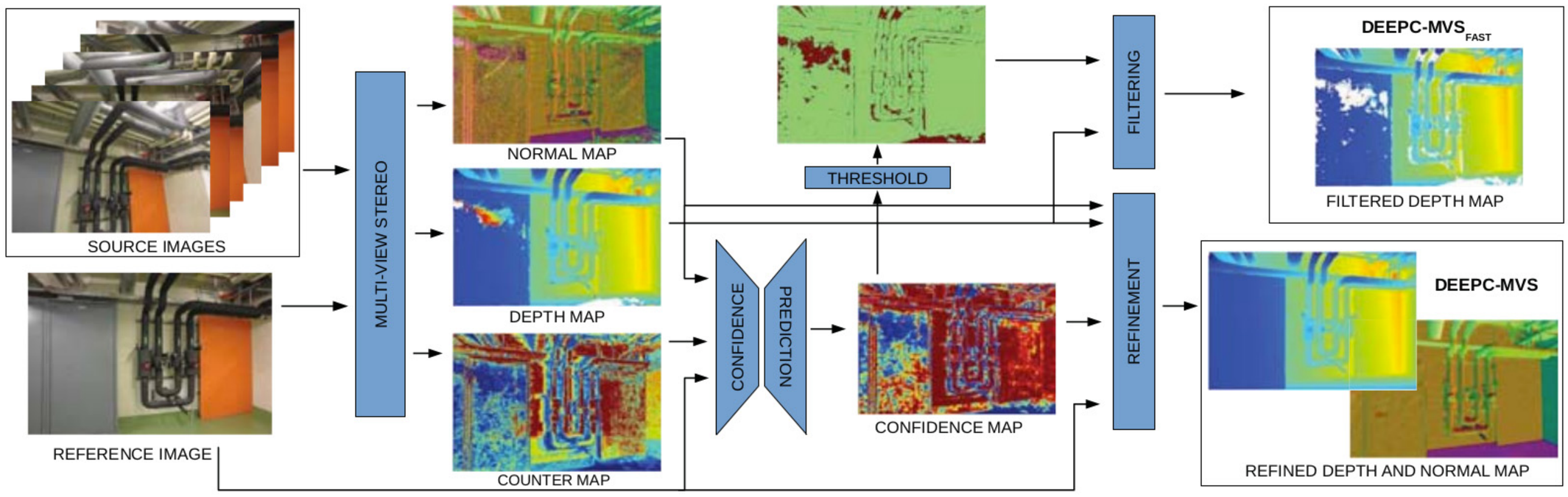
Scientific contribution

ETH3D — Home | Stereo | SLAM | About | Submit

Set: Test | Metric: F_1 score [%] | Tolerance: 2cm | Download this table as CSV

Method	Info	all	high-res multi-view	indoor	outdoor	botani.	boulde.	bridge	door	exhibi.	lectur.	living.	lounge	observ.	old co.	statue	terrac.
DeepPCF-MVS		**80.84** 1	**88.10** 1	**88.56** 1	86.73 7	92.24 7	69.03 13	89.57 16	93.39 5	77.53 3	**89.79** 1	94.12 2	**78.98** 1	96.58 4	**85.66** 1	95.72 2	94.58 3
DeepC-MVS		79.81 2	87.08 2	86.88 2	87.69 3	91.16 10	72.32 6	90.31 11	93.94 2	77.12 5	82.82 5	**94.23** 1	72.13 3	**97.09** 1	84.83 2	95.37 3	93.65 7
Andreas Kuhn, Christian Sormann, Mattia Rossi, Oliver Erdler, Friedrich Fraundorfer: DeepC-MVS: Deep Confidence Prediction for Multi-View Stereo Reconstruction, 3DV 2020																	
DeepC-MVS_fast		79.65 3	86.91 3	86.62 3	87.76 2	93.52 2	72.37 5	91.26 6	93.04 7	76.62 7	84.22 3	93.36 5	71.44 4	96.76 2	80.82 5	95.33 4	94.16 5
Andreas Kuhn, Christian Sormann, Mattia Rossi, Oliver Erdler, Friedrich Fraundorfer: DeepC-MVS: Deep Confidence Prediction for Multi-View Stereo Reconstruction, 3DV 2020																	
PHI-MVS			86.43 4	86.17 5	87.24 5	90.88 13	70.96 9	92.27 4	**94.07** 1	72.45 16	85.22 2	91.90 12	69.47 5	96.42 5	83.28 3	**95.94** 1	94.35 4
CSCG			86.41 5	86.19 4	87.07 6	92.91 5	72.48 4	90.81 8	93.56 4	73.95 15	83.16 4	91.07 16	75.94 2	95.19 9	79.94 6	94.38 5	93.55 8
ACMMP			85.89 6	85.39 6	87.38 4	**93.59** 1	72.63 3	92.74 2	93.18 6	76.78 6	80.73 8	93.82 3	64.33 12	96.29 6	82.67 4	90.69 15	93.23 10

SYSTEM ARCHITECTURE



Contact: DI Michael Haslgrübler, Pro2Future GmbH, michael.haslgruebler@pro2future.at, +43 732 2468 - 9475

Acknowledgement: This work was supported by Pro²Future (FFG, 881844) and Sony Europe B.V.

SONY