Package OpenSCAD for Education/Research

and Improve the User Manual

- Google Season of Docs 2019

Proposal from Yida Wang

1. Self-introduction:

I am Yida Wang, Ph.D. student from [Technical University of Munich](), I am willing to contribute to OpenSCAD GSoD project. I noticed that OpenSCAD participate GSoD this year and I have been using Open3D, OpenCV and other open source tools for 3D tasks for quite a long time. I have some publications related 3D vision topics and 2D topics as well. I also participated twice for Google Summer of Codes with OpenCV so it is totally fine for organising all those pull requests. Here you can find my Resume written in [English](https://wangyida.github.io/files/Resume/resume_YidaWang.pdf) (https://wangyida.github.io/files/Resume/resume_YidaWang.pdf) and [German](https://wangyida.github.io/files/Resume-German/resume_YidaWang-German.pdf) (https://wangyida.github.io/files/Resume-German/resume_YidaWang-German.pdf).

During all those years for research in areas of computer vision, robotics and machine learning, I have some publications in major journal & conferences like **IEEE 3D Vision**, **EE/RSJ International Conference on Intelligent Robots and Systems** and **IEEE transaction of Image Processing which could be found** in [ResearchGate](https://www.researchgate.net/profile/Yida_Wang/research?ev=prf_act) (https://www.researchgate.net/profile/Yida_Wang/research?ev=prf_act). Additionally, a [video]() is also released on [my personal website](https://wangyida.github.io/) (https://wangyida.github.io/) for 3D scene understanding topics. I'm also interested to build a fancy website for OpenSCAD based on similar framework as what I am using for my current 3D vision research (https://wangyida.github.io/).

I am currently working with 3D indoor scene understanding for my thesis and currently have some ongoing CV projects as well. I find that my topics are totally matched to OpenSCAD's interest, so it should be a good chance for me to participate for GSoD this year. The initial plan could be focused two topics which are also rather related to each others.
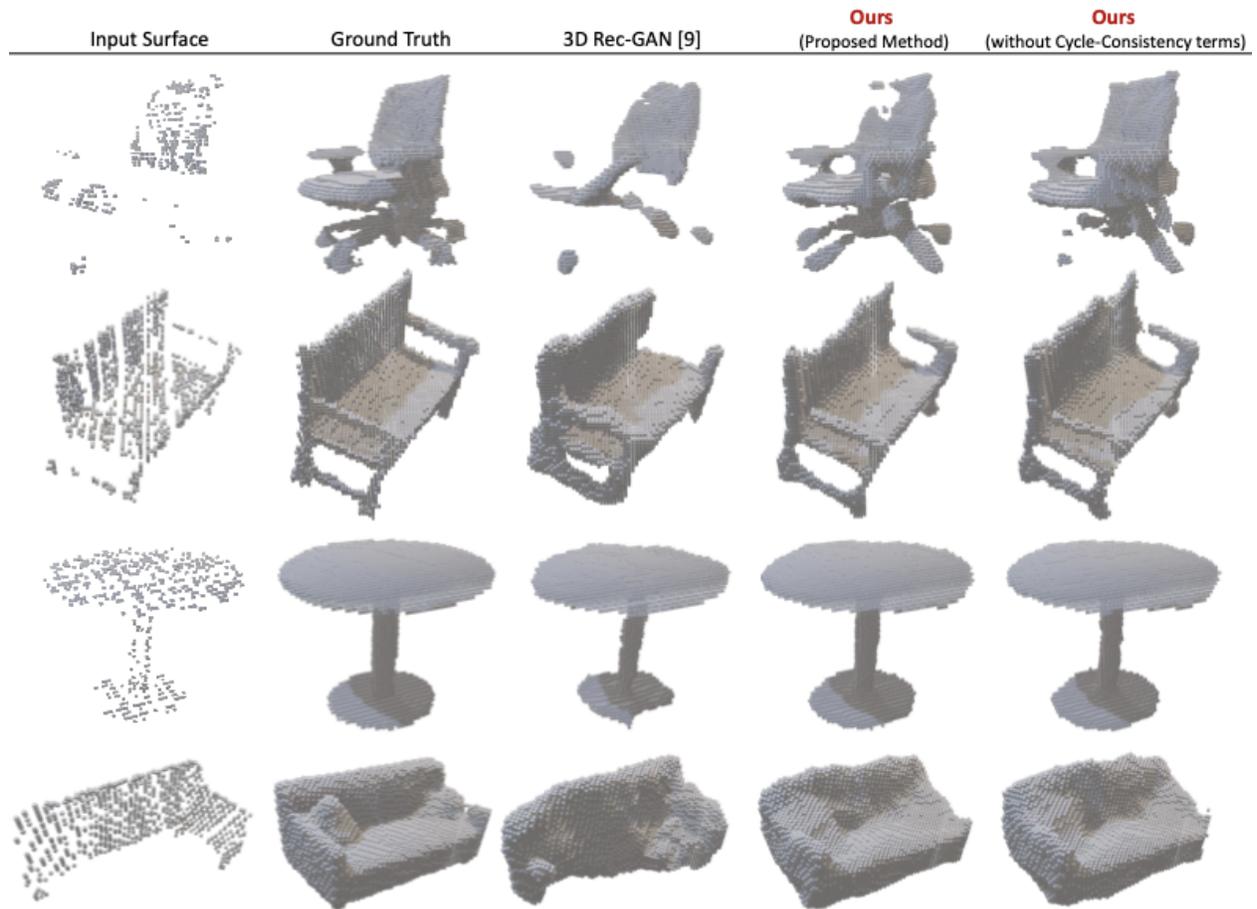
2. Proposals:
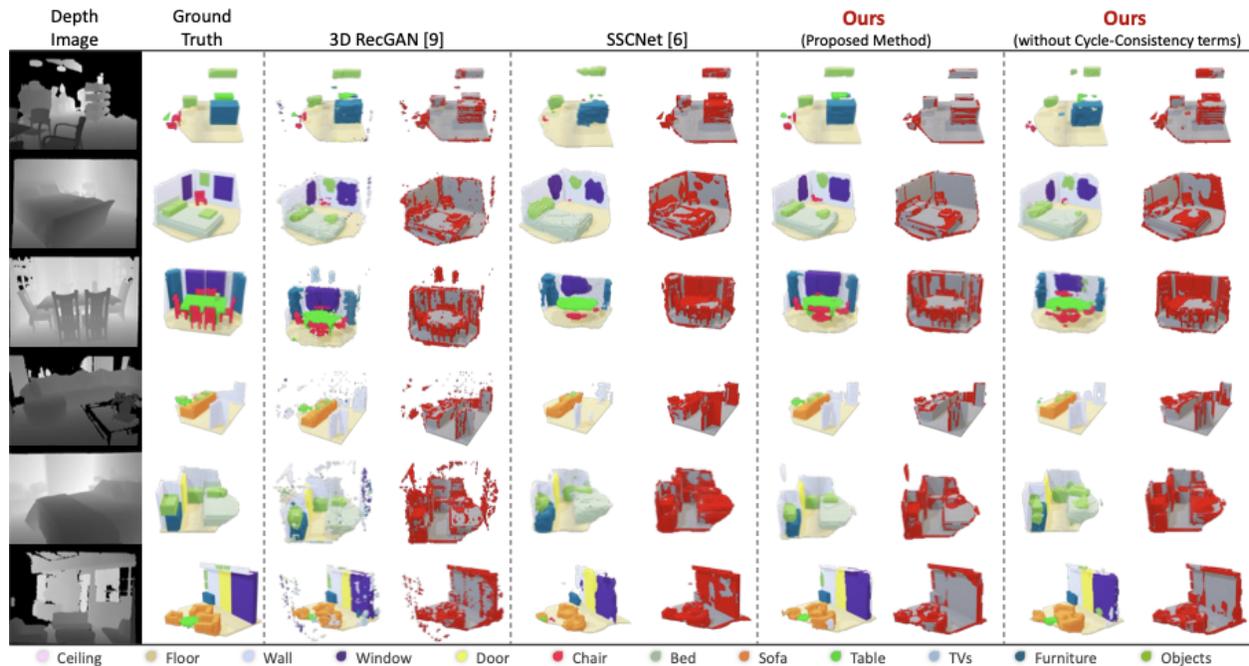## I. Package OpenSCAD for Education/Research
It's good for me to cover the following topics as shown below

- Math Art
- Recursive functions
- Visualization of Geometry
- Graphical display of sequences (fibonacci)
- All about vectors

- Platonic solids
- Creating 3D shapes
- Simple animations for Physics

Personally I can deal with some good 3D visualisation for point clouds, volumetric data and CAD models. Here are some examples I rendered using 3D models for my research papers:

| Depth Image | Ground Truth | 3D RecGAN [9] | SSCNet [6] | Ours (Proposed Method) | Ours (without Cycle-Consistency terms) |

Ceiling   Floor   Wall   Window   Door   Chair   Bed   Sofa   Table   TVs   Furniture   Objects

II. Improve the OpenSCAD User Manual

The OpenSCAD User Manual is maintained at Wikibooks which has the benefit that users can easily contribute changes but it does mean less control regarding what's documented and changed. The manual is usable and has some basic information, but is not that well structured and also skips over some important topics.

It's ok to propose a new workflow / hosting for the documentation if there's a good argument for that which promises also long term maintenance.

So I plan to host it using Hugo (https://gohugo.io/) which is easy to get updated and flexible to get rendered both for desktop and mobile phones.

We can host the whole documents with label-based searching approaches or just with tags like what I am doing here:

Projects

All   Open Source   Deep Learning   Computer Vision   Deep Alternatives

Variational Inference   Compact Network   Metric Learning   Telecommunication

CANTHINK   Other

COLLECTION OF CANTHINK PROJECTS

A collection of projects from Canthink

COMPACT NETWORK

Compact deep structure with good performance.

DEEP ALTERNATIVES

Foreward pass deep structures with local and global descripters.

COMPUTER VISION

Computer vision in 2D, 3D, sequence and frequency space.

METRIC LEARNING

DEEP LEARNING