Supplementary Material
for Downloading and Reproducability

ThingiPano data and related code will be made public via git repositories and dataset-sharing platforms upon publication. We have shared direct-download links below:

Google Drive Link to Dataset and Documentation: https://drive.google.com/drive/folders/10pil6qvwQYu6m9Wf8HPaflOQXL7RmiHt?usp=sharing

GitHub Link where Dataset Information (when download link with Google Drive changes) and Communication about Dataset will be Facilitated: https://github.com/Alexander-Berman/ThingiPano

At this time, do not share the download link as it is limited by Google and all reviewers should be guaranteed a Download before the general public. More permanent sharing, such as archive.org, will be utilized in the future.

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For convenience, below are some previews of files available in the downloads: all fields available in the JSON metadata, and some visual examples of images and panoramas within ThingiPano

User Metadata:

```
top level: list of user instances

user['username'] (str) username shown in all other metadata instances
user['full_name'] (str) name displayed on their page (not always same as username)
user['id'] (int) integer id used on Thingiverse to identify user
user['tip_url'] (str) url to give money to this user

user['IAmA'] (str) description about what the user 'is' (i.e. Maker, Engineer)
user['bio'] (str) short description of the user
user['design_programs'] (str) design programs that user has listed
user['design_level'] (str) design experience self-described by the user

user['avatar_img'] (str) url to user avatar image
user['avatar_background_img'] (str) url to background image behind user avatar image

user['number_collections'] (int) number of collections this user has created
user['number_makes'] (int) number of things this author has published 'makes'
user['number_following'] (int) number of users that this user is following
user['number_followers'] (int) number of users that are following this user
user['number_designs'] (int) number of designs that this user has published
user['number_likes'] (int) number of likes this user has received

user['printers'] (list of str) each string is a printer name

user['groups'] list of groups
  group['name'] display name of group
  group['url'] url to group
  group['img_url'] url to image representing group
  group['member_count'] number of users in group
```

Design Metadata:

```
top level: key from thing_id -> metadata

metadata['id'] (int) Thingiverse 'Thing' ID. Also the key to get this page

metadata['title'] (str) Title of Thing

metadata['banner_featured'] (bool) Featured Page

metadata['banner_education'] (bool) Approved as an Education Page
    metadata['education_subjects'] (str) list of subjects (science, math,
etc.)
    metadata['education_grades'] (str) list of grade levels

metadata['banner_challenge_winner'] (bool) Won a Challenge
    metadata['won_challenge'] (str) What Challenge it Won

metadata['banner_verified'] (bool) Page verified by Thingiverse

metadata['customizer'] (bool) Page is Customizer

metadata['notice_violation'] (bool) Page is violating Thingiverse ToS

metadata['notice_moderation'] (bool) Page removed by moderator

metadata['notice_wip'] (bool) Page is a Work in Progress

metadata['404'] (bool) for some reason page was not found by the script

metadata['author'] (str) Author name

metadata['author_url'] (str) URL to author page

metadata['author_url_img'] (str) URL to image for author

metadata['published_datetime'] (str) Time when Thing was published

metadata['images'] (list) List of URL's of images
    #Note: change ending for different sized images
    # *_preview_tinycard.jpg small
    # *_preview_featured.jpg medium
    # *__display_large.jpg large

metadata['collection_number'] (int) Number of Collections Thing belongs to

metadata['watches'] (int) Number of Users 'watching' Thing

metadata['remixes_number'] (int) Number of times this Thing was directly
remixed

metadata['made_number'] (int) Number of 'Makes'

metadata['views'] (int) Number of Page Views

metadata['downloads'] (int) Number of Downloads

metadata['category'] (str) Category Thing Belongs To (at most one)
    #Note: Subcategories seperated by '/'

metadata['comments_number'] (int) Number of Comments
```

```
metadata['comments'] (list) List of Comments
    comment['comment_id'] (int) Thingiverse Comment ID
    comment['parent_comment'] (int) Comment ID of Parent, None if top level
    comment['depth'] (int) Depth of comment starting at one
    comment['author_url'] (str) URL to author of comment
    comment['author_img'] (str) URL to image of author of comment
    comment['author'] (str) Name of Author
    comment['date'] (str) Date of Comment
    comment['text'] (str) Text (HTML) contained in comment

metadata['tags'] (list) Tuples of ( (str) tag, (str) tag url)

metadata['remixed_from'] (list) List of Dictionaries with the following keys
    remixed_from['thing_id'] (int) Thing ID
    remixed_from['title'] (str) Title of Thing
    remixed_from['author'] (str) Author of Thing
    remixed_from['img'] (str) URL of Image

metadata['license'] (str) Licensing for File

metadata['liked_by'] (list) List of Dictionaries with the following keys
    liked_by['user'] (str) User Name
    liked_by['user_url'] (str) URL to user page
    liked_by['user_img'] (str) URL to user image

metadata['makes'] (list) List of Dictionaries with the following keys
    makes['user'] (str) User Name
    makes['url'] (str) URL to make
    makes['img'] (str) URL to image of Make

metadata['description'] (list) List of Headers and their contained html
    description_section['header'] (str) Title of Section
    description_seciton['text'] (str) HTML of Section

metadata['print_settings'] (list) List of Print Settings
    print_setting[<setting>] (str) Value in setting (settings vary per thing)

metadata['files'] (list) List of Dictionaries with the following keys
    file['download_link'] (str) URL to download individual file
    file['file_name'] (str) Name of the File (including extension)
    file['thing_id'] (int) Thing ID where the file belongs to
    file['file_id'] (int) Thingiverse ID for file
    file['img'] (str) URL to image of file
    file['updated_timestamp'] (str) last time file was updated
    file['downloads'] (int) number of downloads for file
    file['size'] (str) Memory file takes up
```

Example Images and Panoramas: