Thank you for sharing your results on the roughness database

Our hope is that access to surface profiles, surface statistics and flow measurements will aid in the development of predictive correlations for drag over rough surfaces. Please follow the directions below for adding results and naming folders/files to create a consistent format for the database. For assistance, contact details are provided at the end of this document.

Introduction

Step 0: Request access to the database and download the useful files.

If not already done, please go *to http://www.roughnessdatabase.org* and request access to the database.

Once access to the database has been granted you are able to download the useful files found on the database front page as shown in Figure 1.
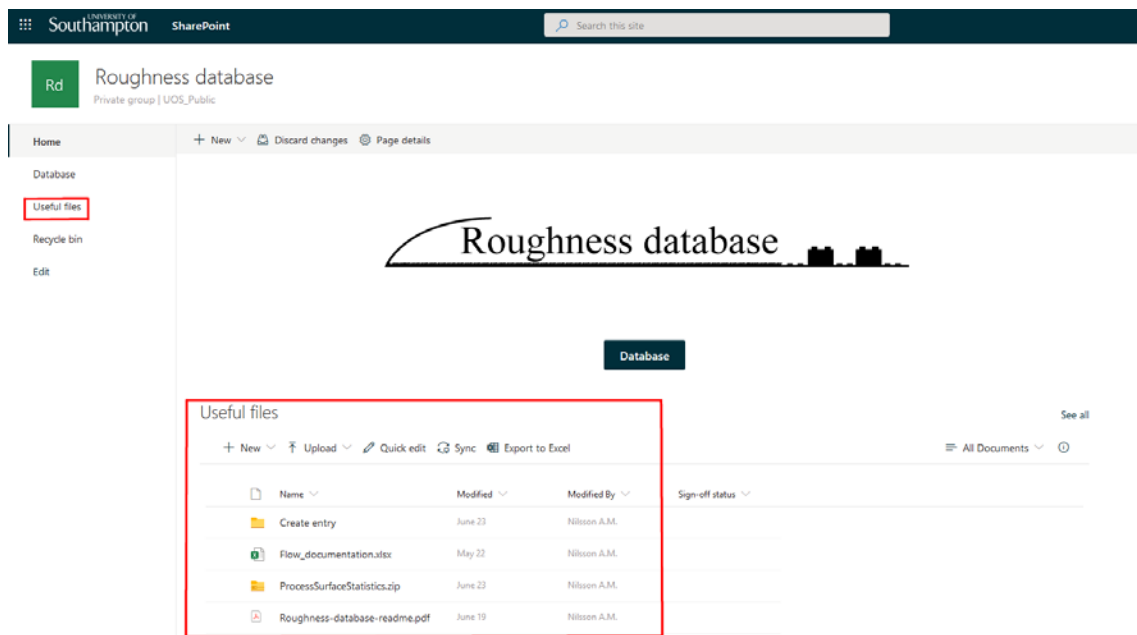

Figure 1- Useful files

The *Useful files* include:

- ProcessSurfaceStatistics.zip   (See step 1)
- A "Non-MATLAB user folder"   **(Not applicable for MATLAB users)**
- A "Create entry" folder   (See step 4)
- Flow_documentation.xlsx   (See step 6)
- Roughness-database-readme.pdf   (A copy of this PDF)

Part 1: Preparing a dataset

Step 1: Unpack the *ProcessSurfaceStatistics.zip* archive

Download and unzip the *ProcessSurfaceStatistics.zip* file in the same directory as your surface coordinate file(s). The archive contains a MATLAB script called *ProcessSurfaceStatistics.m* and two supporting text files, Profiler_batch.txt and Questionnaire_Batch.txt, used by the script.

ProcessSurfaceStatistics.m processes your surface information and outputs directories and new surface information files with the purpose of producing a uniform format across the database.

The script currently supports two types of surfaces: **1D line profiles** or **3D surface scans**. The script can handle input files in the following formats:

- MATLAB files   (**.mat*)
- Excel files   (**.xls* or **.xlsx*)
- ASCII files   (**.csv*, or tab-delimited **.txt* or **.dat*)

Please make sure that you provide surface coordinates in one of these file formats.
More details on the input file requirements is provided in the comments at the beginning of the script file.

After unpacking the zip-file your folder should look like in Figure 2, where *Scratch.xlsx* is a sample surface coordinate file.

ProcessSurfaceStatistics.m	05/06/2020 10:37	MATLAB Code	22 KB
Profiler_Batch.txt	05/06/2020 10:37	Text Document	1 KB
Questionnaire_Batch.txt	05/06/2020 10:37	Text Document	1 KB
Scratch.xlsx	05/06/2020 10:38	Microsoft Excel Worksh...	728 KB

Figure 2 - Folder with *ProcessSurfaceStatistics.m* script and surface data file

Step 2: Fill in Questionnaire_Batch.txt

Open *Questionnaire_Batch.txt* and edit it to suit the surface you are going to upload to the database.

Please use the following convention (an example is shown in Figure 3):

1) **Hom** (homogeneous) or **Het** (heterogeneous) roughness

2) **Reg** (regular) or **Irreg** (irregular) arrangement (random or realistic surfaces would come under Irregular – even if the tiles have a regular arrangement)

3) **TBL** (turbulent boundary layers) or **Pipe** or **Channel**

4) **Exp** (experiments) or **Sim** (simulations)

5) **Descriptor** (one- or two-word descriptor for the surface)

6) **Author** last name (This should be name of the author who is depositing the dataset)

7) **Year** (This should be year of paper that was published or year when the dataset is deposited)

8) **Identifying name** of the surface

9) **DOI** of any relevant publication

Save and close the file

```
 1  # This text files help the user to aviod answering the same questions, with
 2  # the same answers multiple times. This would hopefully save the user's time
 3  # when processing multiple surfaces.
 4  # Questions from 1 to 4 are standarized and must be either options inside
 5  # the bracket, so pay attention to the capitalization
 6
 7  # 1- What kind of suface is it? [Hom (Homogeneous), Het (Heterogeneous)]
 8  Hom
 9
10  # 2- Is the roughness ...? [Reg (Regular), Irreg (Irregular)]
11  Irreg
12
13  # 3- Are the results for a ...? [TBL, Pipe, Channel]
14  TBL
15
16  # 4- Are the results from ...? [Exp (Experiments), Sim (Simulations)]
17  Exp
18
19  # 5- What is the general descriptor of this surface, e.g. 'Sandgrain'?
20  Scratched Epoxy
21
22  # 6- What is the last name of the lead author of the study?
23  Schultz
24
25  # 7- What year were the results published?
26  2007
27
28  # 8- What is the identifying name of this surface, e.g. '220Grit'?
29  Scratch
30
31  # 9- Include the DOI of the publication
32  doi:10.1017/S00221120070055
```

Figure 3 - Questionnaire_Batch.txt example

Step 3: Run *ProcessSurfaceStatistics.m*

Open *ProcessSurfaceStatistics.m* in MATLAB and run the script.

When it finishes, the directory where you run the script will now contain a new folder named based on the information you provided in the *Questionnaire_Batch.txt* file. The general naming follows the naming convention:

Issues running *ProcessSurfaceStatistics.m*

If you have any problems running *ProcessSurfaceStatistics.m*, please visit

https://github.com/jmbarrojr/SurfaceRoughnessStatistics

for contact information and the latest version of the script.

Roughness-type_Arrangement_Flow-type_Data-type_Descriptor_Author_Year

And following the previous example,

Example: Hom_Irreg_TBL_Exp_Scratched Epoxy_Schultz_2007

Your folder should now look like in figure 4. The folder created contains three subfolders as shown in figure 5. The *Flow documentation* and *Papers* folders are currently empty but navigating into the *Surfaces* folder we find three data files generated by the script containing surface information and statistics, see figure 6.

Name	Date modified	Type	Size
Hom_Irreg_TBL_Exp_Scratched Epoxy_Schultz_2007_Sc...	19/06/2020 16:05	File folder	
ProcessSurfaceStatistics.m	05/06/2020 10:37	MATLAB Code	22 KB
Profiler_Batch.txt	05/06/2020 10:37	Text Document	1 KB
Questionnaire_Batch.txt	05/06/2020 10:37	Text Document	1 KB
Scratch.xlsx	05/06/2020 10:38	Microsoft Excel Worksh...	728 KB

Figure 4 - New folder created after running ProcessSurfaceStatistics.m

Figure 5 - Sub-folders created by the script

Figure 6 - Contents of the *Surfaces* sub-folder

Part 2: Uploading datasets

Step 4: Go to the database and create a database entry for each new rough surface that you may have.

If your study considered multiple surfaces, then please create a new entry for each surface. This will allow end users to gain information for each surface easily and make the repository searchable and accessible easily.

A new entry is created by navigating to the *Useful files/Create entry* folder from the database front page.

Drag drop the folder created by *ProcessSurfaceStatistics.m* into the *Create entry* as shown in figure 7 and 8. Alternatively, you can click the "Upload → Folder" button and navigate to the folder you want to upload.

Please note that you can create several entries at the same time by uploading several folders.

> **Uploading without all data prepared**
>
> **Folders can also be uploaded even if they do not contain all the data you want to share.**
> If you have any issues with the dataset preparation for example, you can upload the entry as it is (empty or partially populated) following the instructions below, and then add remaining files later.
>
> **If you name folders manually** it is important to follow the naming convention
>
> *Roughness-type_Arrangement_Flow-type_Data-type_Descriptor_Author_Year*
>
> including the underscores (or the database entry will not be created).

An automatic SharePoint script running in the background will now create and tag your database entry. The script takes about a minute to run depending on the size of the surface scan files associated with your contribution. When the script finishes running the folder dropped into the *Create entry* folder is automatically deleted and an email is sent to you saying the entry has been created.
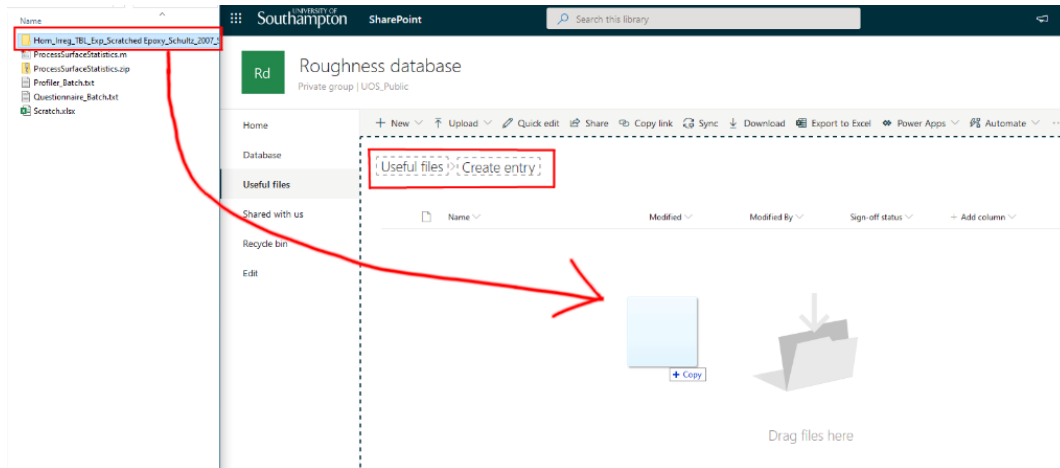

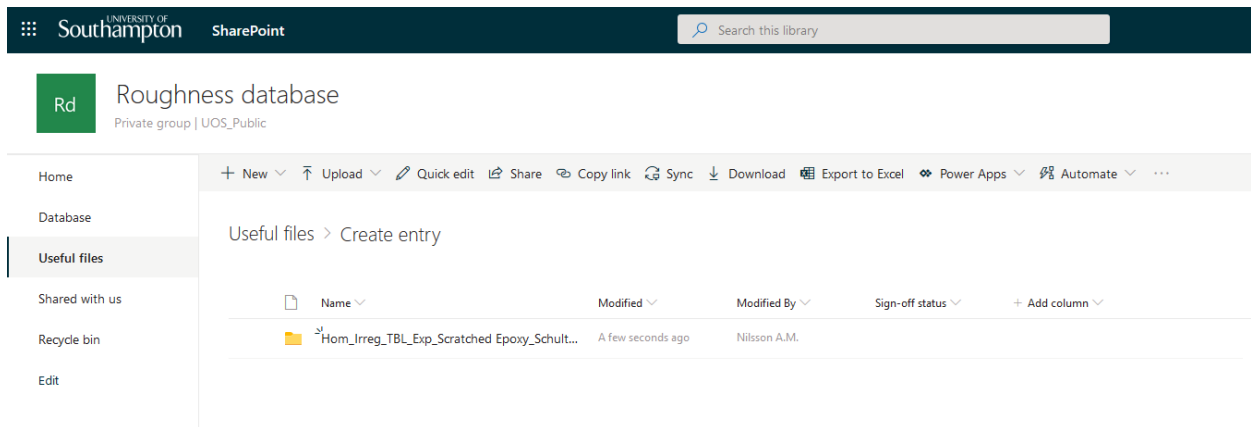Figure 7 - Drag-drop MATLAB output into *Create entry*

Figure 8 - Folder dropped into *Create entry*

Navigate to the *Database* where you will find your newly created entry with an identical name to the output folder from the *ProcessSurfaceStatistics.m*, see Figure 9.
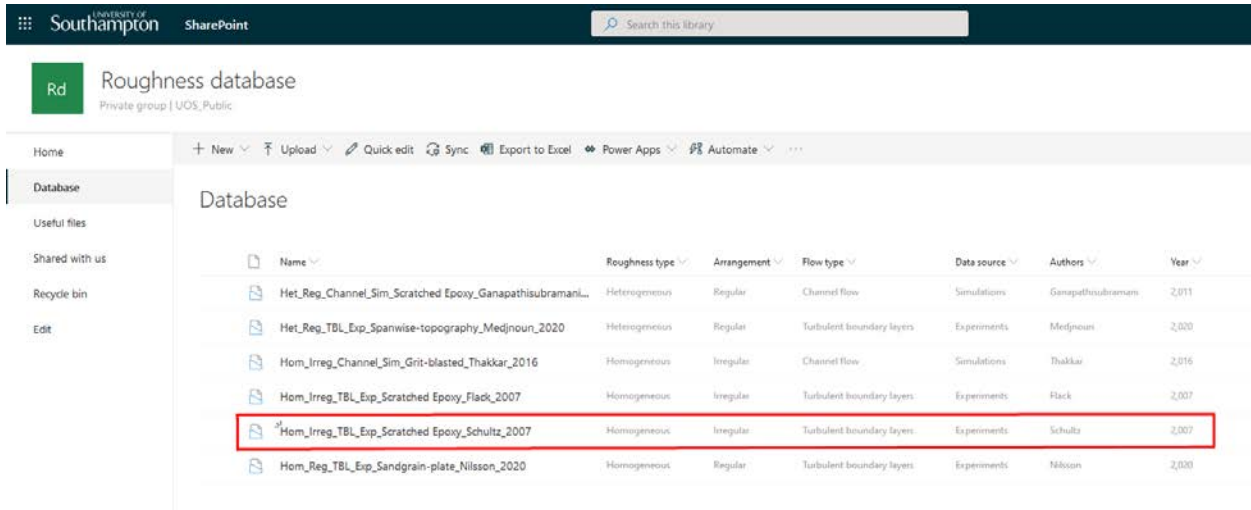

Figure 9 - Database entry created by automatic background script

Navigating into the entry we find the contents of the *ProcessSurfaceStatistics.m* output folder have been automatically populated inside the database entry.
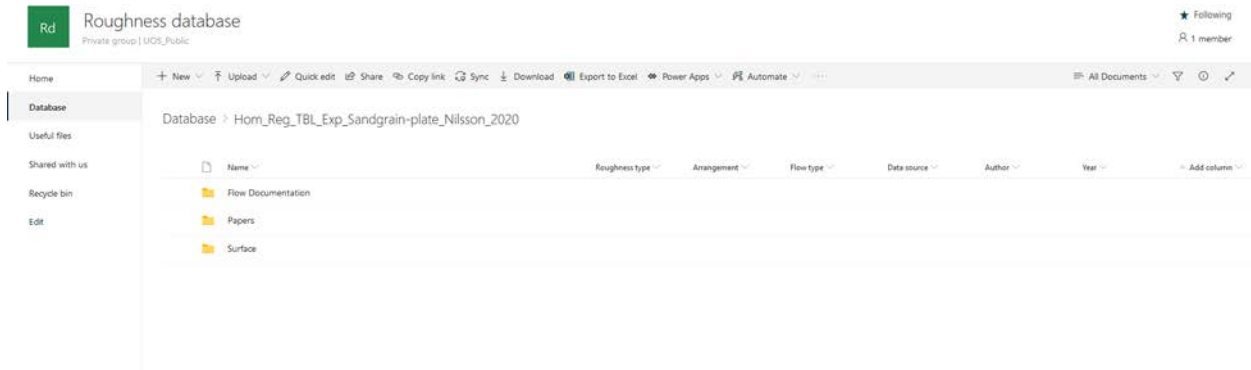

Figure 10 - Database entry populated by *ProcessSurfaceStatistics*.m output

Step 5: Create a References.txt file that has the references (All publications) that you want an end-user to cite if they use this dataset. It would be ideal to have the full reference including DOI.

Upload or drag and drop this text file into the database entry. Also upload any relevant journal papers (subject to copyright permissions), conference papers, theses or reports related to the roughness you may want to share into the *Papers* folder.

Step 6: Create a file with flow documentation and upload to the *Flow Documentation* folder

Upload a table of basic flow parameters. The table should contain as a minimum the information in the Excel template, *Flow_documentation.xlsx*, provided in the *Useful files* folder on the database homepage. Additional flow parameters can be included as needed based on your specific case.

A summary of how the database entry files and folders are organized is shown on the next page

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Contact

Do you have questions, improvement suggestions or need help to prepare or upload your contribution?

Please do not hesitate to contact M.Nilsson@soton.ac.uk including [Roughness database] in the subject.

Summary of Organization of Database Folders and Files

```
Folder containing flow over a given roughness
  Use naming convention
  │
  ├── Folder containing surface information
  │     Surface
  │     ├── xyz coordinate file
  │     └── surface statistics file
  │
  ├── File containing references for the dataset
  │     (References.txt)
  │
  ├── Folder containing flow documentation
  │     Flow Documentation
  │     └── File containing table of flow parameters
  │
  └── Folder containing journal and conference papers
        Papers
        ├── Files of joural paper
        └── Files of conference paper
```