Semi-Procedural Textures Using Point Process Texture Basis Functions

Guehl Pascal, Allègre Rémi, Dischler Jean-Michel, Benes Bedrich and Galin Eric

Replicability from Binaries

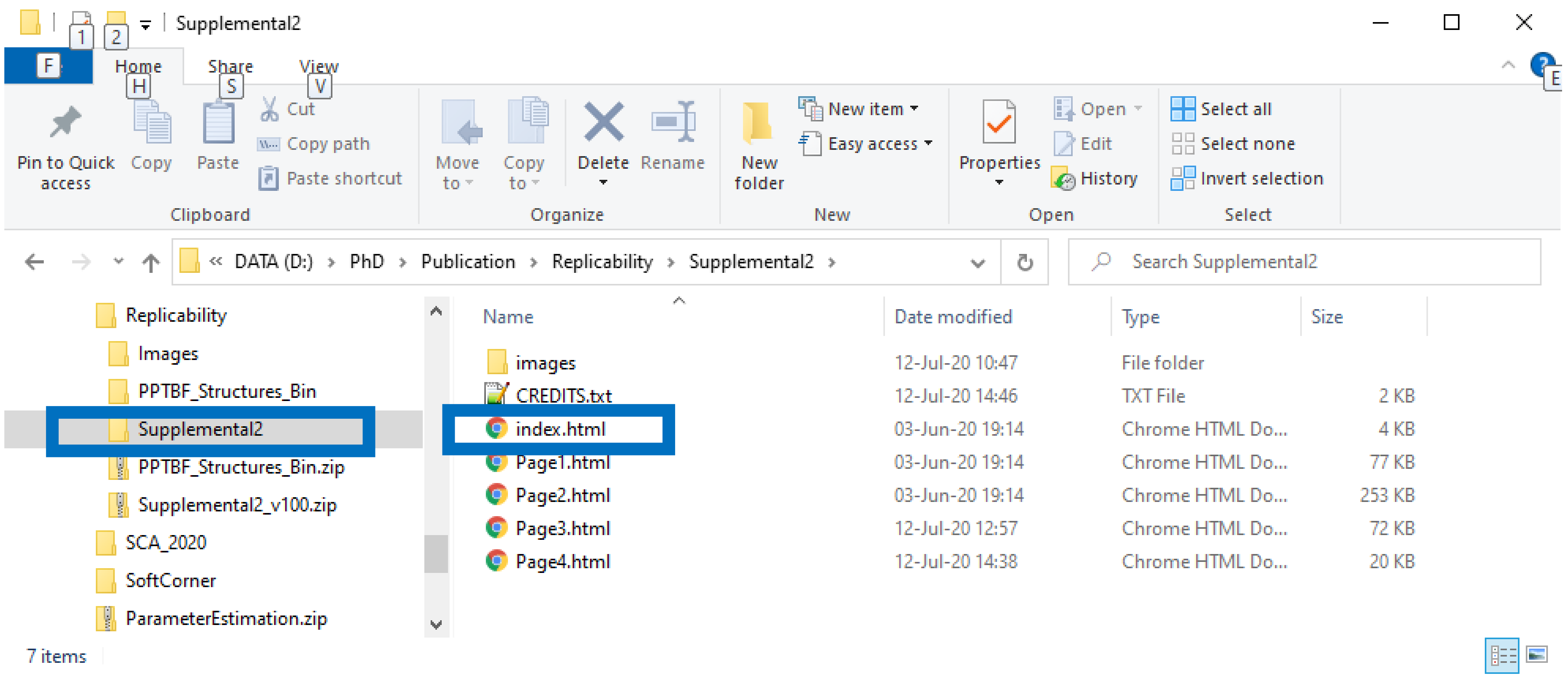
Our GITHUB website: https://github.com/ASTex-ICube/semiproctex
contains the original paper, its supplemental materials, source code and binaries.

I. Retrieving the supplemental material

DOWNLOAD the supplemental material archive:
http://igg.unistra.fr/People/semiproctex/data/Supplemental2_v100.zip

I. Retrieving the supplemental material

UNZIP file: Supplemental2_v100.zip
GO TO directory: yourPATH\Supplemental2
OPEN webpage (double-click): yourPATH\Supplemental2\index.html



« DATA (D:) › PhD › Publication › Replicability › Supplemental2 ›

Name	Date modified	Type	Size
images	12-Jul-20 10:47	File folder	
CREDITS.txt	12-Jul-20 14:46	TXT File	2 KB
index.html	03-Jun-20 19:14	Chrome HTML Do...	4 KB
Page1.html	03-Jun-20 19:14	Chrome HTML Do...	77 KB
Page2.html	03-Jun-20 19:14	Chrome HTML Do...	253 KB
Page3.html	12-Jul-20 12:57	Chrome HTML Do...	72 KB
Page4.html	12-Jul-20 14:38	Chrome HTML Do...	20 KB

I. Retrieving the supplemental material

You should see the webpage on the right.
CLICK ON table of content: 1. Parameters estimation
to see our database of 147 parameter files (.txt format)
that have been used to generate 147 binary images
of our model of stochastic procedural structures.

TABLE COLUMNS:

- LEFT: input image (user provided)
- MIDDLE: image procedurally generated by the program
- RIGHT: parameter file (.txt) used to generate MIDDLE image

The figure 11 of our paper (below) is a collection of 12 of these generated images.

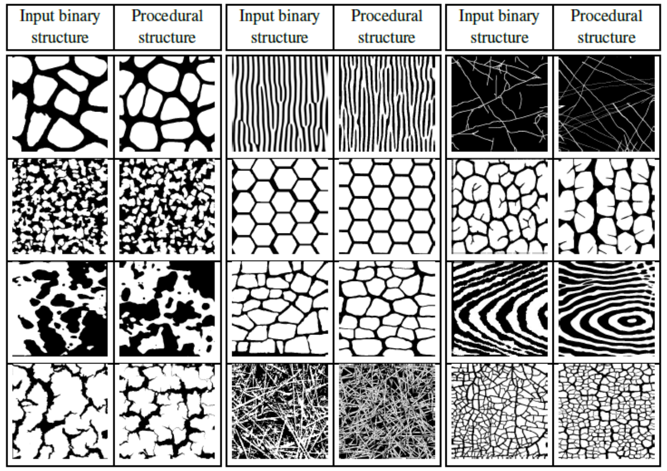
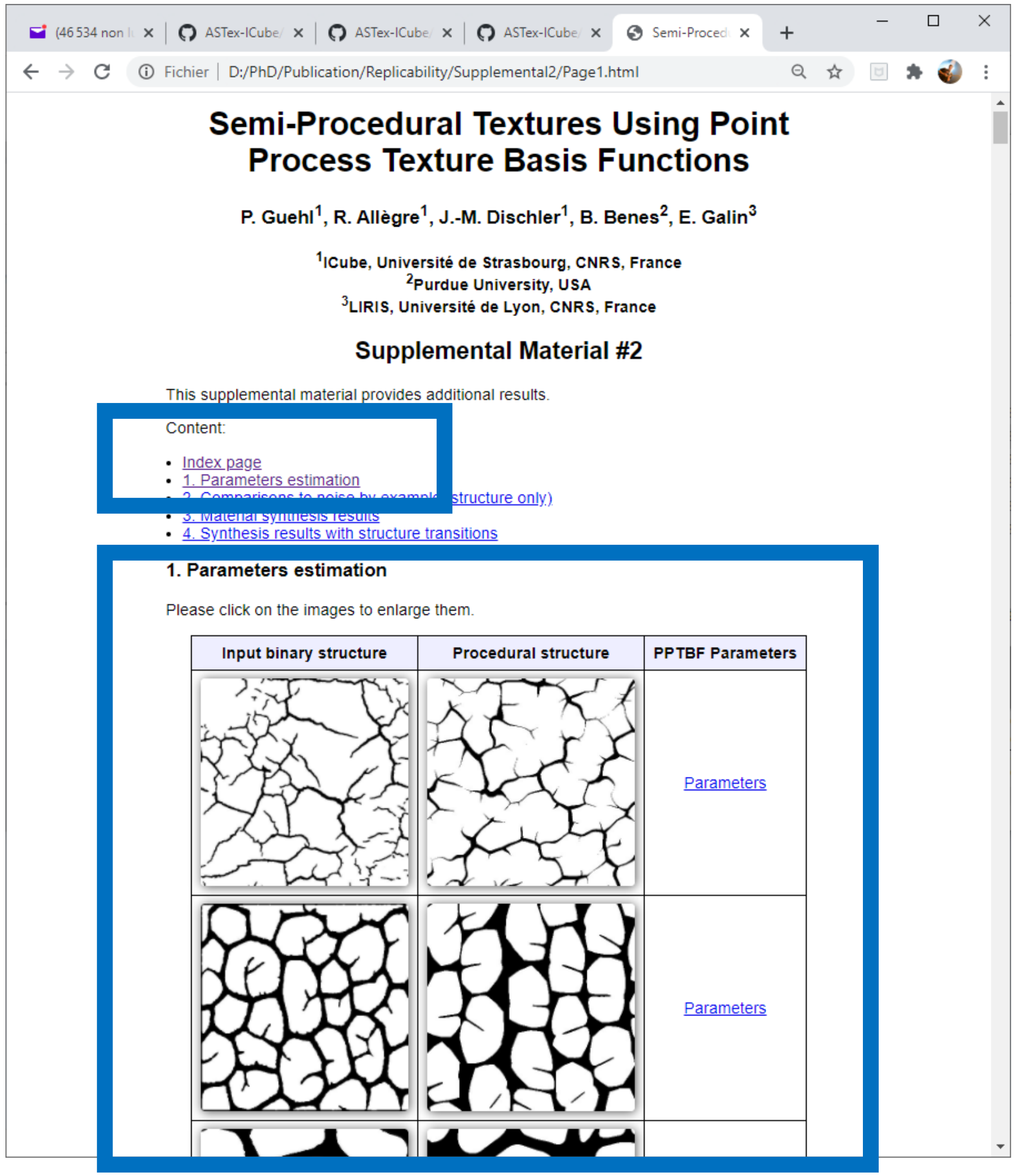


Figure 11: *Evaluation of the capability of PPTBF to produce natural structures (we use segmented images on left): parameters were estimated by querying a collection of 450k samples and by applying refinement.*



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Fichier | D:/PhD/Publication/Replicability/Supplemental2/Page1.html

Semi-Procedural Textures Using Point Process Texture Basis Functions

P. Guehl[1], R. Allègre[1], J.-M. Dischler[1], B. Benes[2], E. Galin[3]

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Supplemental Material #2

This supplemental material provides additional results.

Content:

- Index page
- 1. Parameters estimation
- 2. Comparisons to noise by example (structure only)
- 3. Material synthesis results
- 4. Synthesis results with structure transitions

1. Parameters estimation

Please click on the images to enlarge them.

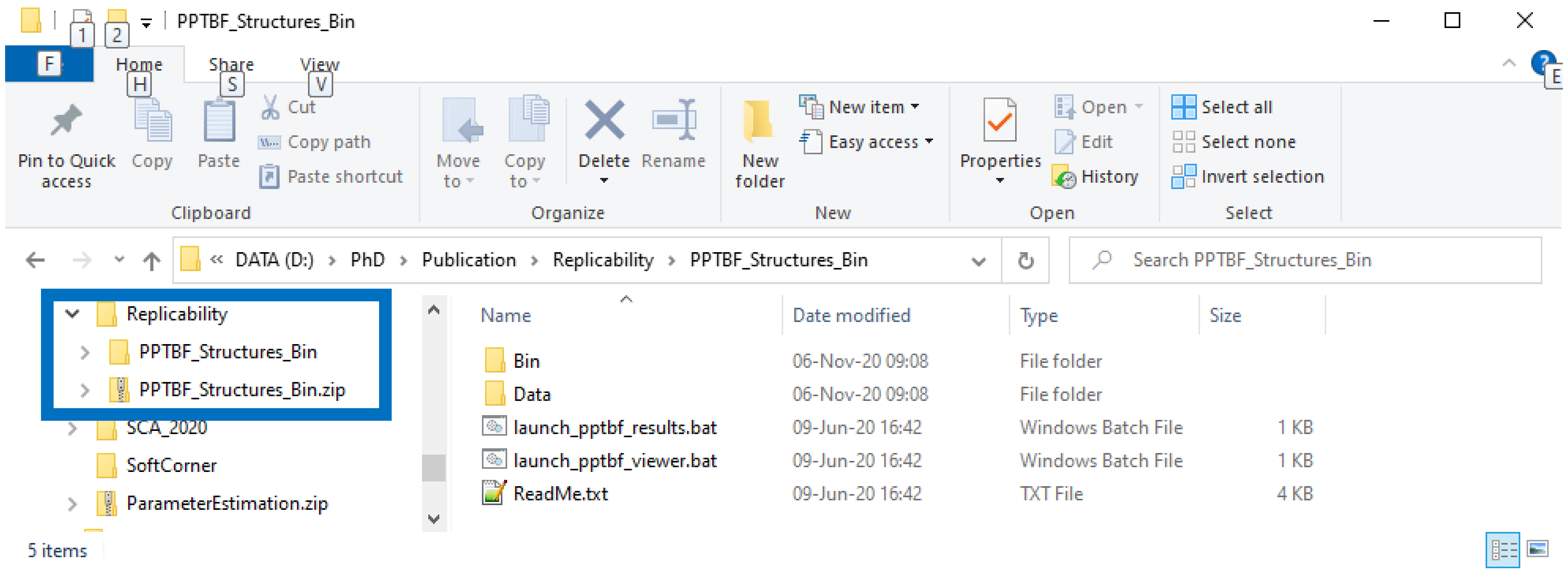
Input binary structure	Procedural structure	PPTBF Parameters
		Parameters
		Parameters

II. Retrieving the binaries

DOWNLOAD precompiled binaries archive: PPTBF_Structures_Bin.zip
http://igg.unistra.fr/people/semiproctex/PPTBF_Structures_Bin.zip

II. Retrieving the binaries

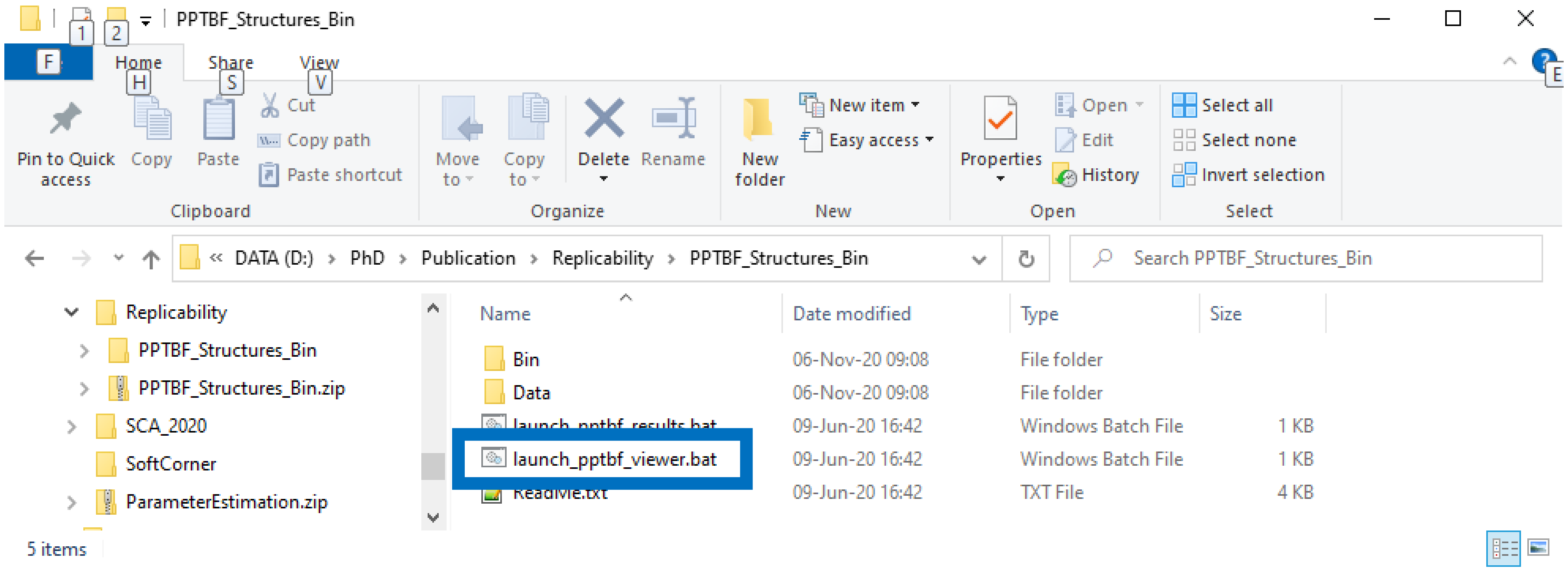
UNZIP file: PPTBF_Structures_Bin.zip
GO TO directory: yourPATH\PPTBF_Structures_Bin



Name	Date modified	Type	Size
Bin	06-Nov-20 09:08	File folder	
Data	06-Nov-20 09:08	File folder	
launch_pptbf_results.bat	09-Jun-20 16:42	Windows Batch File	1 KB
launch_pptbf_viewer.bat	09-Jun-20 16:42	Windows Batch File	1 KB
ReadMe.txt	09-Jun-20 16:42	TXT File	4 KB

III. Check Graphics Program

LAUNCH the 3D graphics viewer with SCRIPT: launch_pptbf_viewer.bat



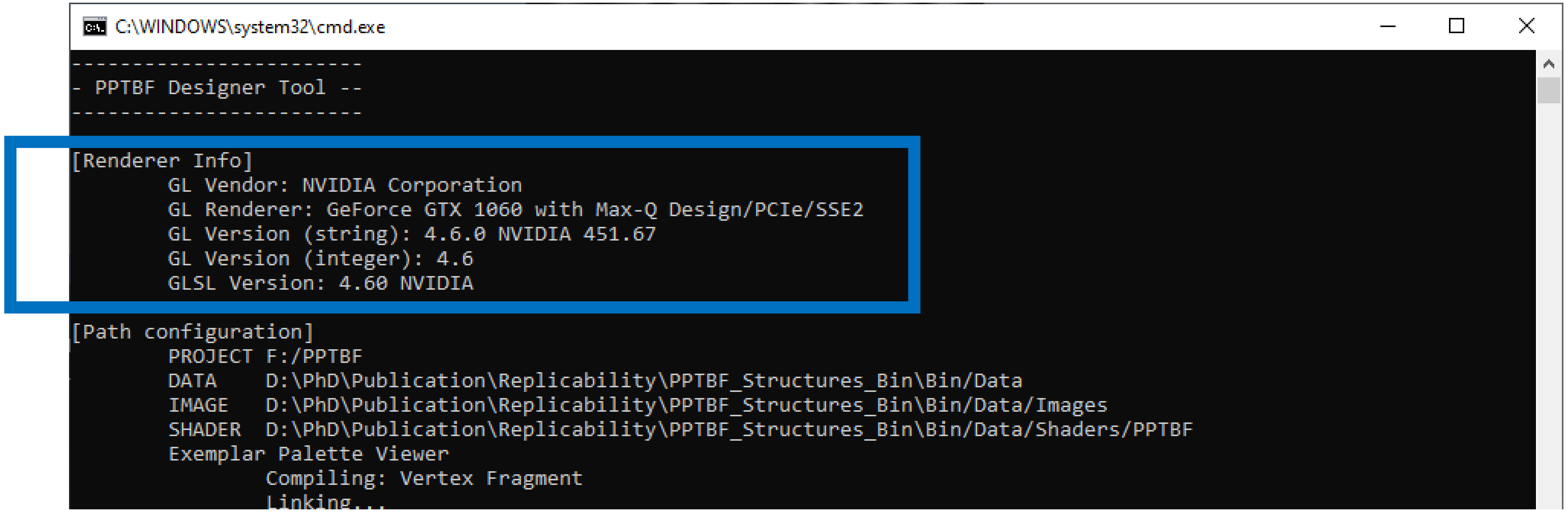
Name	Date modified	Type	Size
Bin	06-Nov-20 09:08	File folder	
Data	06-Nov-20 09:08	File folder	
launch_pptbf_results.bat	09-Jun-20 16:42	Windows Batch File	1 KB
launch_pptbf_viewer.bat	09-Jun-20 16:42	Windows Batch File	1 KB
ReadMe.txt	09-Jun-20 16:42	TXT File	4 KB

III. Check Graphics Program

a DOS window opens and LOG some info
Check “Renderer Info”: you MUST see your graphics card (GPU), but NOT an “integrated“ one such as INTEL
NOTE : We have tested the softwares with the following graphics cards (we use OpenGL 4.6 with compute shaders):

- NVidia GeForce 1060 GTX (6Go)
- NVidia RTX 2070 (8 Go)

IF “integrated”, the viewer will not launch or crash, see next slide

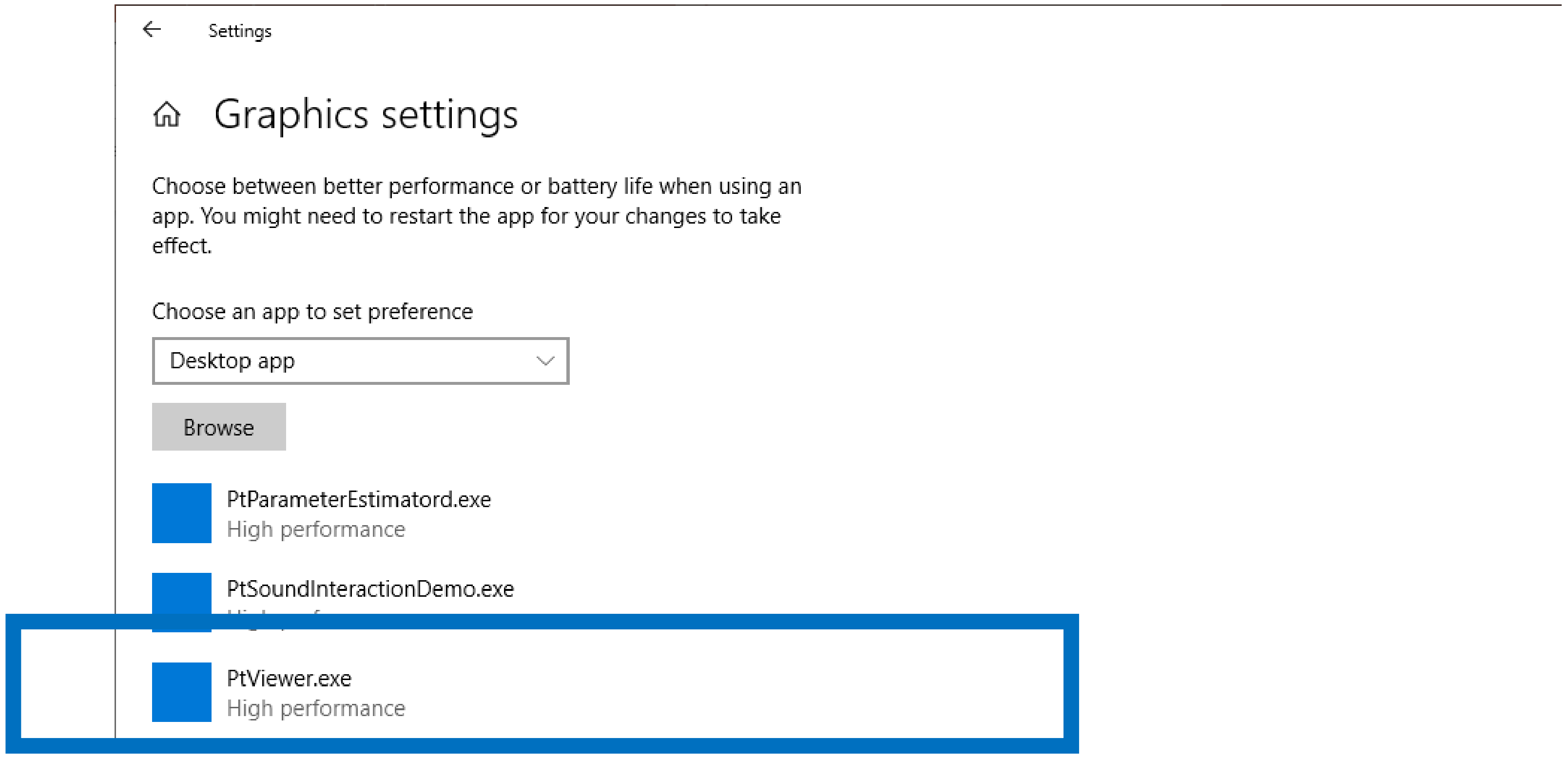


C:\WINDOWS\system32\cmd.exe

```
------------------------
- PPTBF Designer Tool --
------------------------

[Renderer Info]
        GL Vendor: NVIDIA Corporation
        GL Renderer: GeForce GTX 1060 with Max-Q Design/PCIe/SSE2
        GL Version (string): 4.6.0 NVIDIA 451.67
        GL Version (integer): 4.6
        GLSL Version: 4.60 NVIDIA

[Path configuration]
        PROJECT F:/PPTBF
        DATA    D:\PhD\Publication\Replicability\PPTBF_Structures_Bin\Bin/Data
        IMAGE   D:\PhD\Publication\Replicability\PPTBF_Structures_Bin\Bin/Data/Images
        SHADER  D:\PhD\Publication\Replicability\PPTBF_Structures_Bin\Bin/Data/Shaders/PPTBF
        Exemplar Palette Viewer
                Compiling: Vertex Fragment
                Linking...
```

III. Check Graphics Program

IF using “integrated” device by default (this is classical on LAPTOP to optimize battery),
the two programs yourPath\PPTBF_Structures_Bin\Bin\PtViewer.exe
and yourPath\PPTBF_Structures_Bin\Bin\PtBDDGenerator.exe
have to be added in the list of programs in the “Graphics settings” preferences of Windows 10
to launch it with High Performance



Choose between better performance or battery life when using an app. You might need to restart the app for your changes to take effect.

Choose an app to set preference

Desktop app

PtParameterEstimatord.exe
High performance

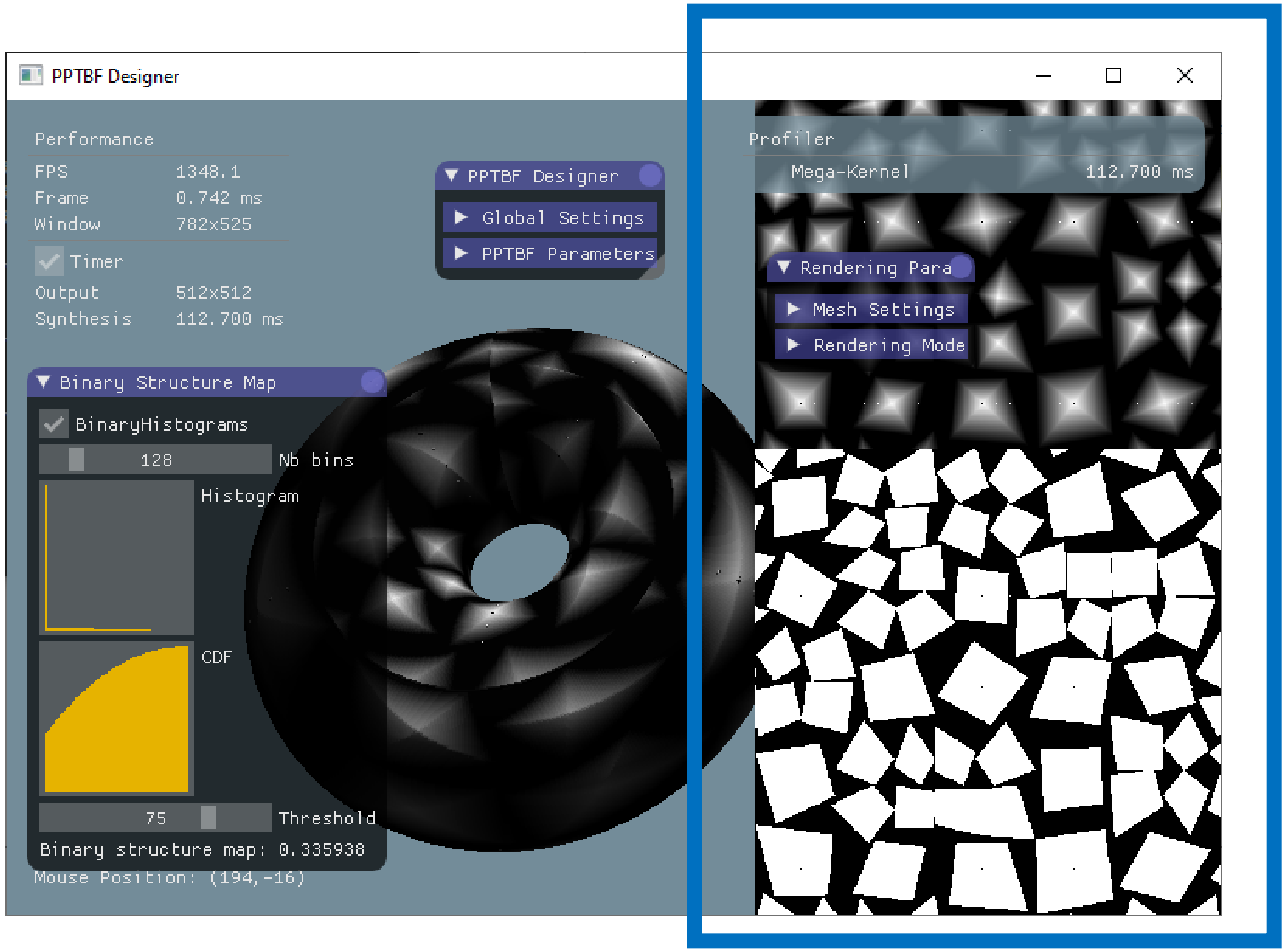
PtSoundInteractionDemo.exe

PtViewer.exe
High performance

III. Check Graphics Program

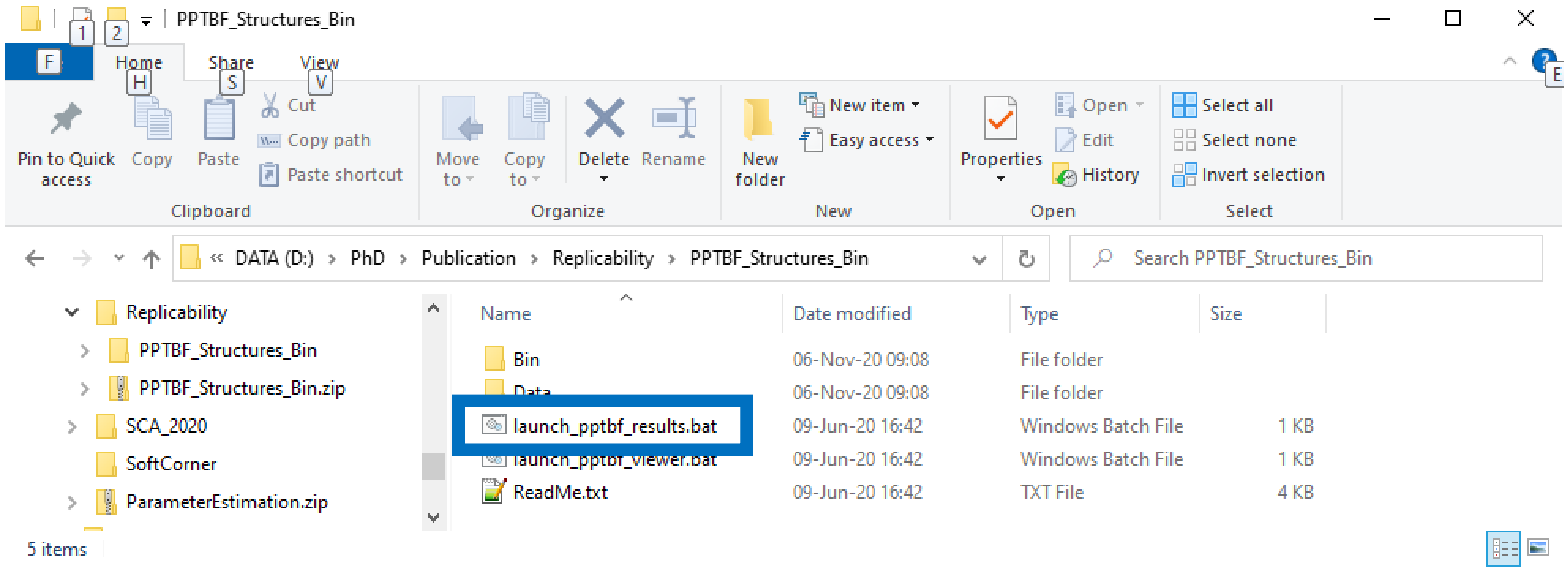
If program works, you should see a 3D graphics viewer with 2D images on the right

- these images are our generated “stochastic procedural structures”
- this is the kind of images we are going to generate in batch mode (with script) to reproduce all our related results



IV. Launch Results generation

LAUNCH the SCRIPT to generate all (supplemental) results : launch_pptbf_results

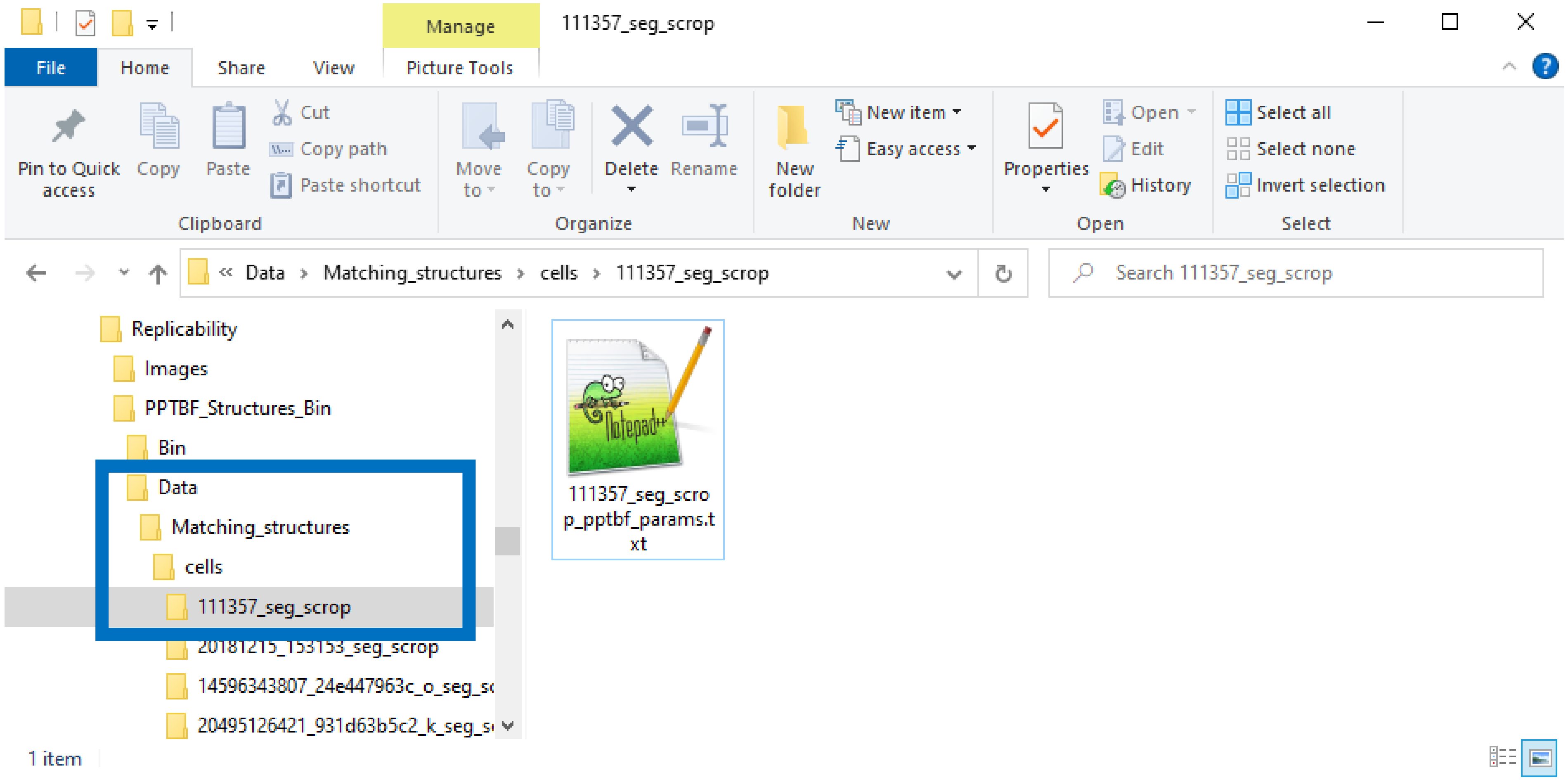


« DATA (D:) › PhD › Publication › Replicability › PPTBF_Structures_Bin

Name	Date modified	Type	Size
Bin	06-Nov-20 09:08	File folder	
Data	06-Nov-20 09:08	File folder	
launch_pptbf_results.bat	09-Jun-20 16:42	Windows Batch File	1 KB
launch_pptbf_viewer.bat	09-Jun-20 16:42	Windows Batch File	1 KB
ReadMe.txt	09-Jun-20 16:42	TXT File	4 KB

IV. Launch Results generation

The program will generate 2 images for each parameter file located in subfolders of the data directory:
yourPath\Data\Data\Matching_structures
Data is classified by type (cells, lines, dots, etc…) in subdirectories, with 1 directory per parameter file (as below)



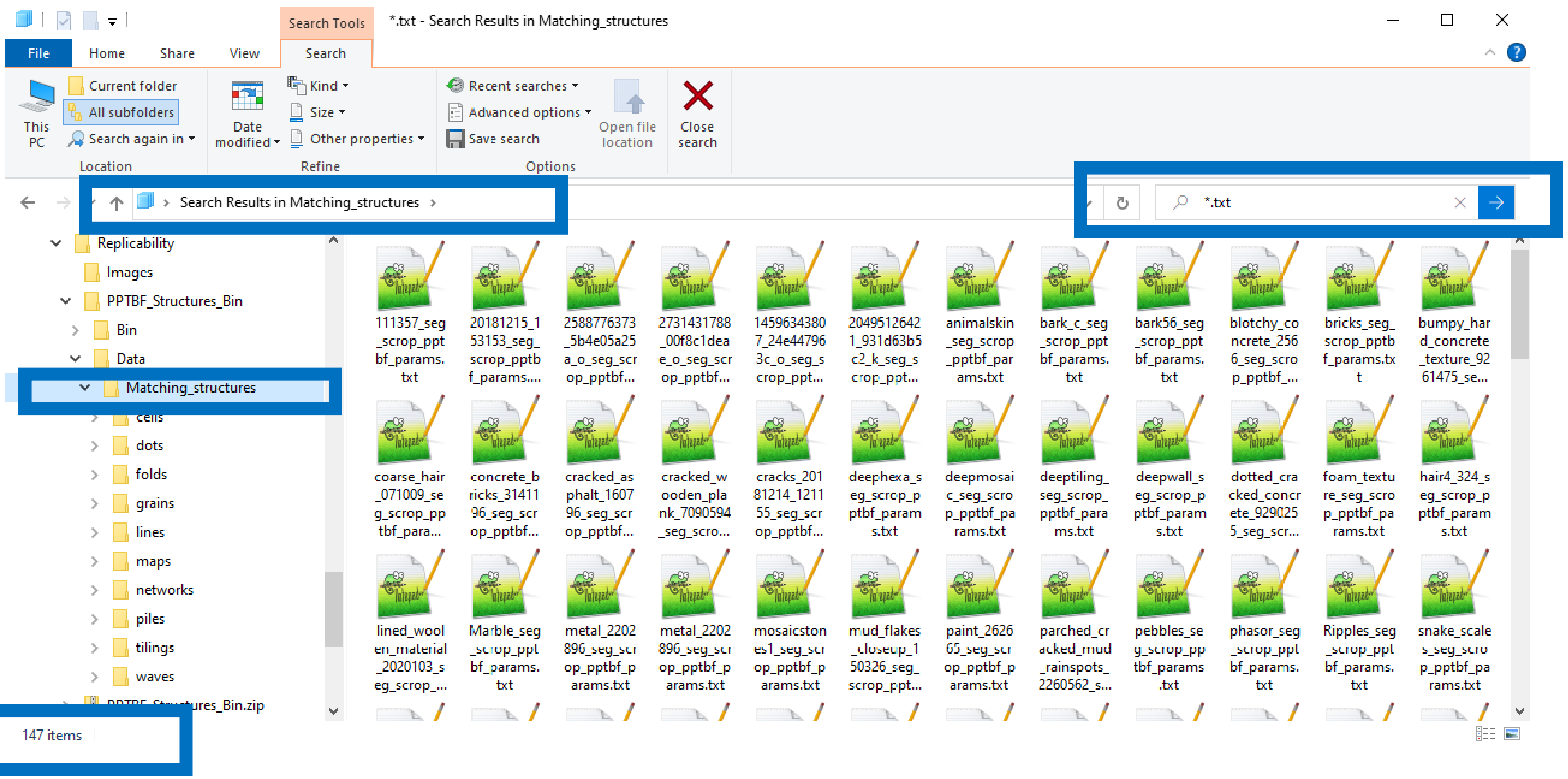
« Data › Matching_structures › cells › 111357_seg_scrop

- Replicability
  - Images
  - PPTBF_Structures_Bin
    - Bin
    - Data
      - Matching_structures
        - cells
          - 111357_seg_scrop
          - 20181215_153153_seg_scrop
          - 14596343807_24e447963c_o_seg_sc
          - 20495126421_931d63b5c2_k_seg_s

111357_seg_scrop_pptbf_params.txt

IV. Launch Results generation

ALL DATA is classified by type (cells, lines, dots, etc…) in subdirectories
TO SEE ALL, just search for parameter files *.txt
Our supplemental material contains 147 files (see below):



*.txt - Search Results in Matching_structures

Search Results in Matching_structures

*.txt

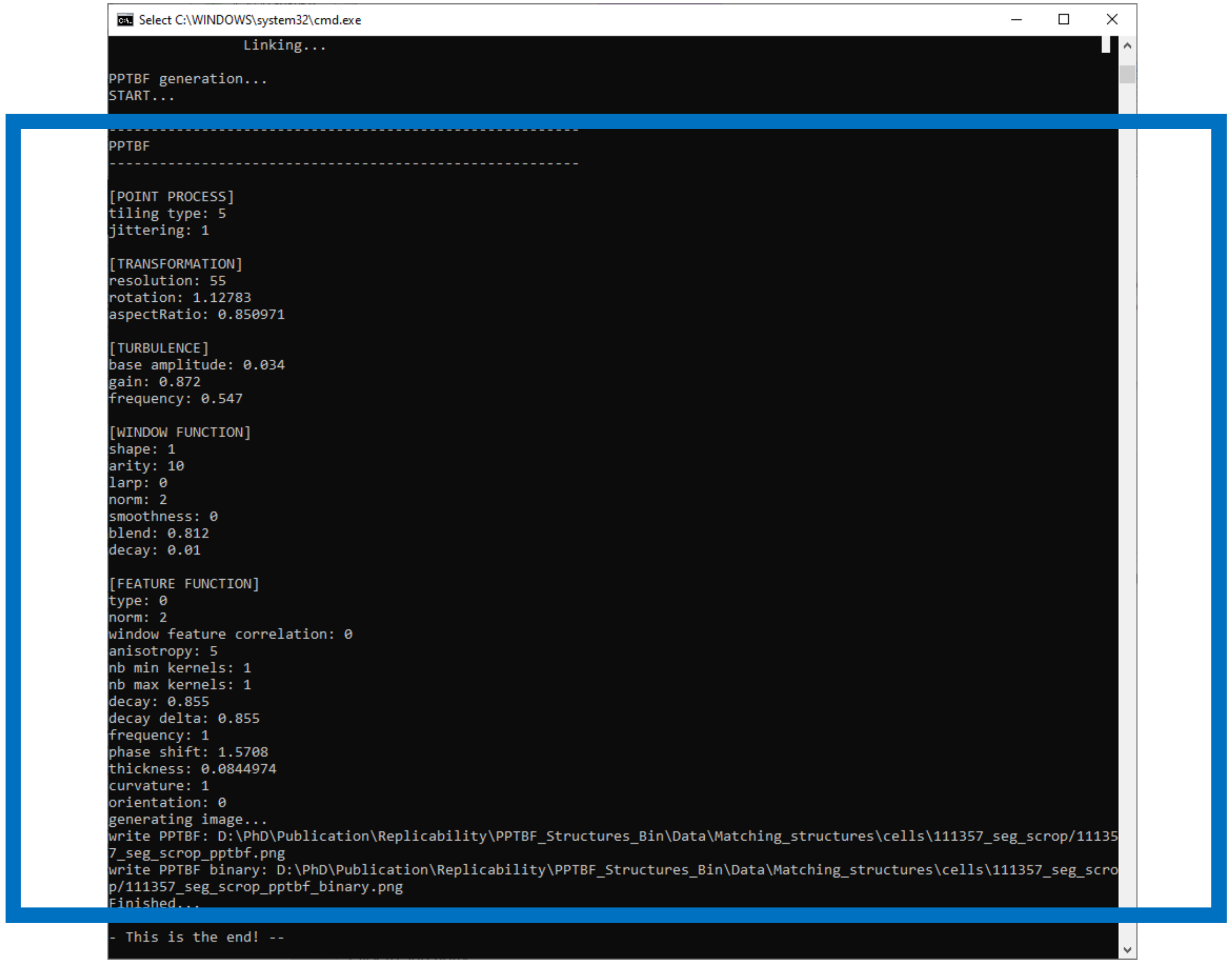
- Replicability
  - Images
  - PPTBF_Structures_Bin
    - Bin
    - Data
      - Matching_structures
        - cells
        - dots
        - folds
        - grains
        - lines
        - maps
        - networks
        - piles
        - tilings
        - waves
  - PPTBF_Structures_Bin.zip

147 items

111357_seg_scrop_pptbf_params.txt
20181215_153153_seg_scrop_pptbf_params....
2588776373_5b4e05a25a_o_seg_scrop_pptbf...
2731431788_00f8c1deae_o_seg_scrop_pptbf...
14596343807_24e447963c_o_seg_scrop_ppt...
20495126421_931d63b5c2_k_seg_scrop_ppt...
animalskin_seg_scrop_pptbf_params.txt
bark_c_seg_scrop_pptbf_params.txt
bark56_seg_scrop_pptbf_params.txt
blotchy_concrete_2566_seg_scrop_pptbf_...
bricks_seg_scrop_pptbf_params.txt
bumpy_hard_concrete_texture_9261475_se...
coarse_hair_071009_seg_scrop_pptbf_para...
concrete_bricks_3141196_seg_scrop_pptbf...
cracked_asphalt_160796_seg_scrop_pptbf...
cracked_wooden_plank_7090594_seg_scro...
cracks_20181214_121155_seg_scrop_pptbf...
deephexa_seg_scrop_pptbf_params.txt
deepmosaic_seg_scrop_pptbf_params.txt
deeptiling_seg_scrop_pptbf_params.txt
deepwall_seg_scrop_pptbf_params.txt
dotted_cracked_concrete_9290255_seg_scr...
foam_texture_seg_scrop_pptbf_params.txt
hair4_324_seg_scrop_pptbf_params.txt
lined_wooden_material_2020103_seg_scrop_...
Marble_seg_scrop_pptbf_params.txt
metal_2202896_seg_scrop_pptbf_params.txt
metal_2202896_seg_scrop_pptbf_params.txt
mosaicstones1_seg_scrop_pptbf_params.txt
mud_flakes_closeup_150326_seg_scrop_ppt...
paint_262665_seg_scrop_pptbf_params.txt
parched_cracked_mud_rainspots_2260562_s...
pebbles_seg_scrop_pptbf_params.txt
phasor_seg_scrop_pptbf_params.txt
Ripples_seg_scrop_pptbf_params.txt
snake_scales_seg_scrop_pptbf_params.txt

IV. Launch Results generation

a DOS window opens and LOG some info
For each parameter file, the program reads it and displays its parameters info, then generate 2 images (.png format) and write them in the same directory

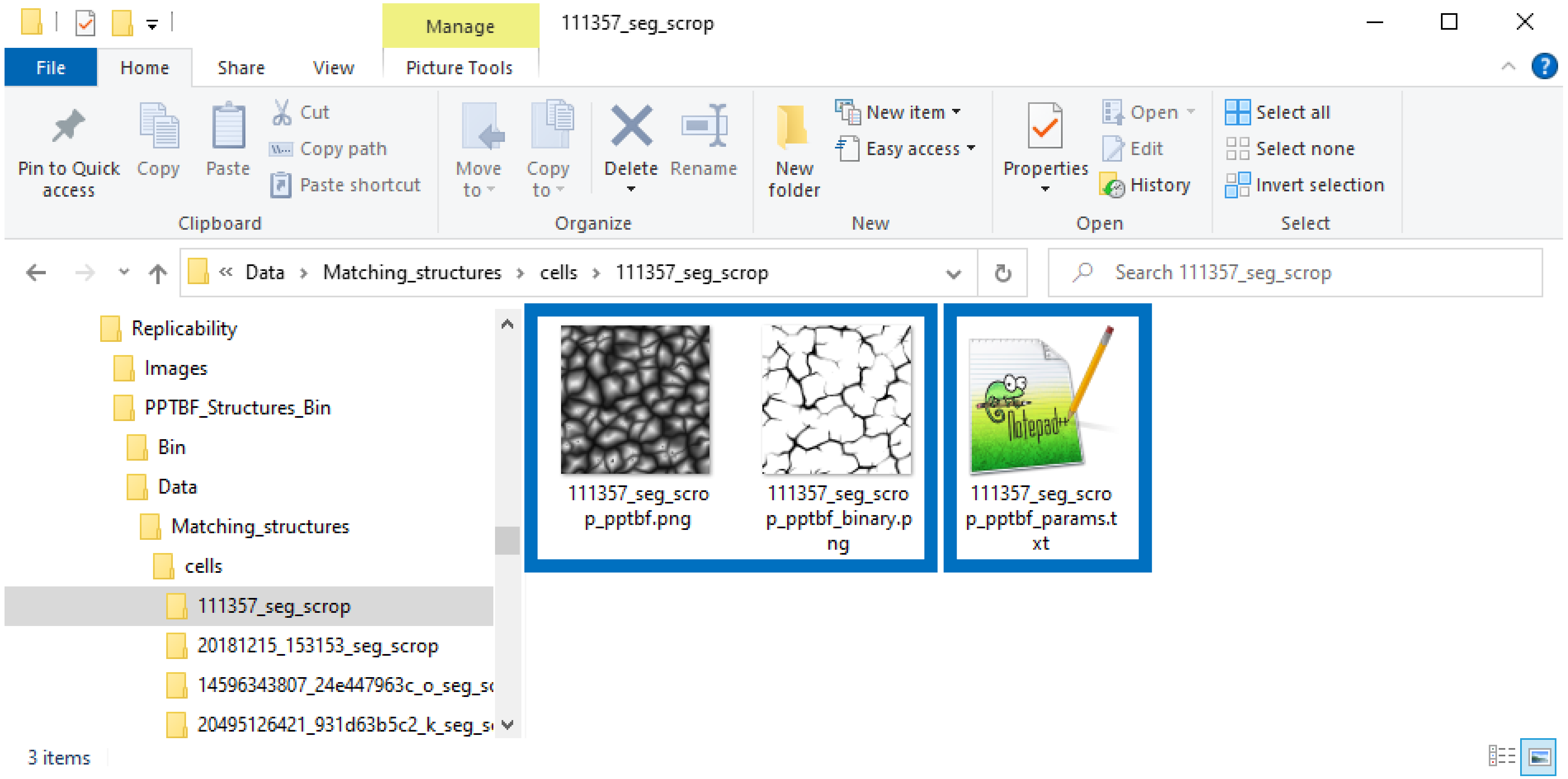


```
                Linking...

PPTBF generation...
START...
--------------------------------------------------------
PPTBF
--------------------------------------------------------

[POINT PROCESS]
tiling type: 5
jittering: 1

[TRANSFORMATION]
resolution: 55
rotation: 1.12783
aspectRatio: 0.850971

[TURBULENCE]
base amplitude: 0.034
gain: 0.872
frequency: 0.547

[WINDOW FUNCTION]
shape: 1
arity: 10
larp: 0
norm: 2
smoothness: 0
blend: 0.812
decay: 0.01

[FEATURE FUNCTION]
type: 0
norm: 2
window feature correlation: 0
anisotropy: 5
nb min kernels: 1
nb max kernels: 1
decay: 0.855
decay delta: 0.855
frequency: 1
phase shift: 1.5708
thickness: 0.0844974
curvature: 1
orientation: 0
generating image...
write PPTBF: D:\PhD\Publication\Replicability\PPTBF_Structures_Bin\Data\Matching_structures\cells\111357_seg_scrop/11135
7_seg_scrop_pptbf.png
write PPTBF binary: D:\PhD\Publication\Replicability\PPTBF_Structures_Bin\Data\Matching_structures\cells\111357_seg_scro
p/111357_seg_scrop_pptbf_binary.png
Finished...

- This is the end! --
```

IV. Launch Results generation

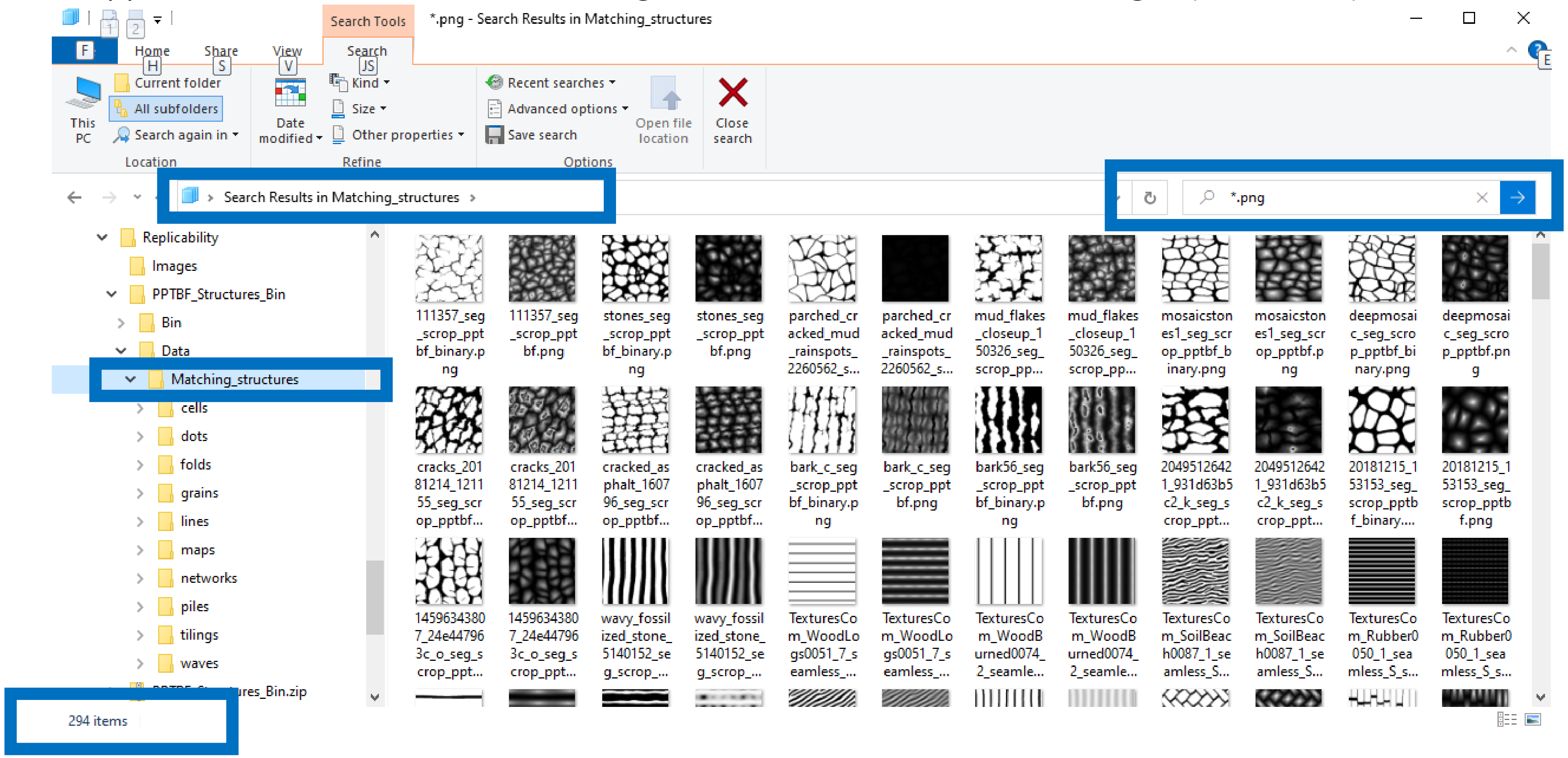
If program works, you should see 2 images (.png) in the same directory for each parameter file :

- one image xxx_pptbf.png that is the stochastic procedural structure (grayscale)
- one image xxx_pptbf_binary.png that is its binary version (the one we want to compare)



IV. Launch Results generation

ALL generated DATA is classified by type (cells, lines, dots, etc…) in subdirectories
TO SEE ALL, just search for generated images files   *.png
Our supplemental material contains 2 images for each 147 files, so 294 images (see below):


*.png - Search Results in Matching_structures
Search Tools
F
Home
Share
View
Search
This PC
Current folder
All subfolders
Search again in
Location
Date modified
Kind
Size
Other properties
Refine
Recent searches
Advanced options
Save search
Open file location
Close search
Options
Search Results in Matching_structures
*.png
Replicability
Images
PPTBF_Structures_Bin
Bin
Data
Matching_structures
cells
dots
folds
grains
lines
maps
networks
piles
tilings
waves
294 items
111357_seg_scrop_pptbf_binary.png
111357_seg_scrop_pptbf.png
stones_seg_scrop_pptbf_binary.png
stones_seg_scrop_pptbf.png
parched_cracked_mud_rainspots_2260562_s...
parched_cracked_mud_rainspots_2260562_s...
mud_flakes_closeup_150326_seg_scrop_pp...
mud_flakes_closeup_150326_seg_scrop_pp...
mosaicstones1_seg_scrop_pptbf_binary.png
mosaicstones1_seg_scrop_pptbf.png
deepmosaic_seg_scrop_pptbf_binary.png
deepmosaic_seg_scrop_pptbf.png
cracks_20181214_121155_seg_scrop_pptbf...
cracks_20181214_121155_seg_scrop_pptbf...
cracked_asphalt_160796_seg_scrop_pptbf...
cracked_asphalt_160796_seg_scrop_pptbf...
bark_c_seg_scrop_pptbf_binary.png
bark_c_seg_scrop_pptbf.png
bark56_seg_scrop_pptbf_binary.png
bark56_seg_scrop_pptbf.png
20495126421_931d63b5c2_k_seg_scrop_ppt...
20495126421_931d63b5c2_k_seg_scrop_ppt...
20181215_153153_seg_scrop_pptbf_binary....
20181215_153153_seg_scrop_pptbf.png
14596343807_24e447963c_o_seg_scrop_ppt...
14596343807_24e447963c_o_seg_scrop_ppt...
wavy_fossilized_stone_5140152_seg_scrop_...
wavy_fossilized_stone_5140152_seg_scrop_...
TexturesCom_WoodLogs0051_7_seamless_...
TexturesCom_WoodLogs0051_7_seamless_...
TexturesCom_WoodBurned0074_2_seamle...
TexturesCom_WoodBurned0074_2_seamle...
TexturesCom_SoilBeach0087_1_seamless_S...
TexturesCom_SoilBeach0087_1_seamless_S...
TexturesCom_Rubber0050_1_seamless_S_s...
TexturesCom_Rubber0050_1_seamless_S_s...

V. Compare results

In the figure 11, you can find the following replicated images:

LEFT COLUMN (top to bottom):

- 20181215_153153_seg_scrop_pptbf_binary.png
- bumpy_hard_concrete_texture_9261475_seg_scrop_pptbf_binary.png [NOTE: for this image, you may find a difference due to a translation in the original article]
- foam_texture_seg_scrop_pptbf_binary
- mud_flakes_closeup_150326_seg_scrop_pptbf_binary.png

MIDDLE COLUMN (top to bottom):

- phasor_seg_scrop_pptbf_binary.png
- deephexa_seg_scrop_pptbf_binary.png
- mosaicstones1_seg_scrop_pptbf_binary.png
- straw_seg_scrop_pptbf_binary.png

RIGHT COLUMN (top to bottom):

- Marble_seg_scrop_pptbf_binary.png
- 14596343807_24e447963c_o_seg_scrop_pptbf_binary.png
- whiteash_seg_scrop_pptbf_binary.png
- TexturesCom_Crackles0011_S_seg_scrop_pptbf_binary.png

Check next slide for comparisons

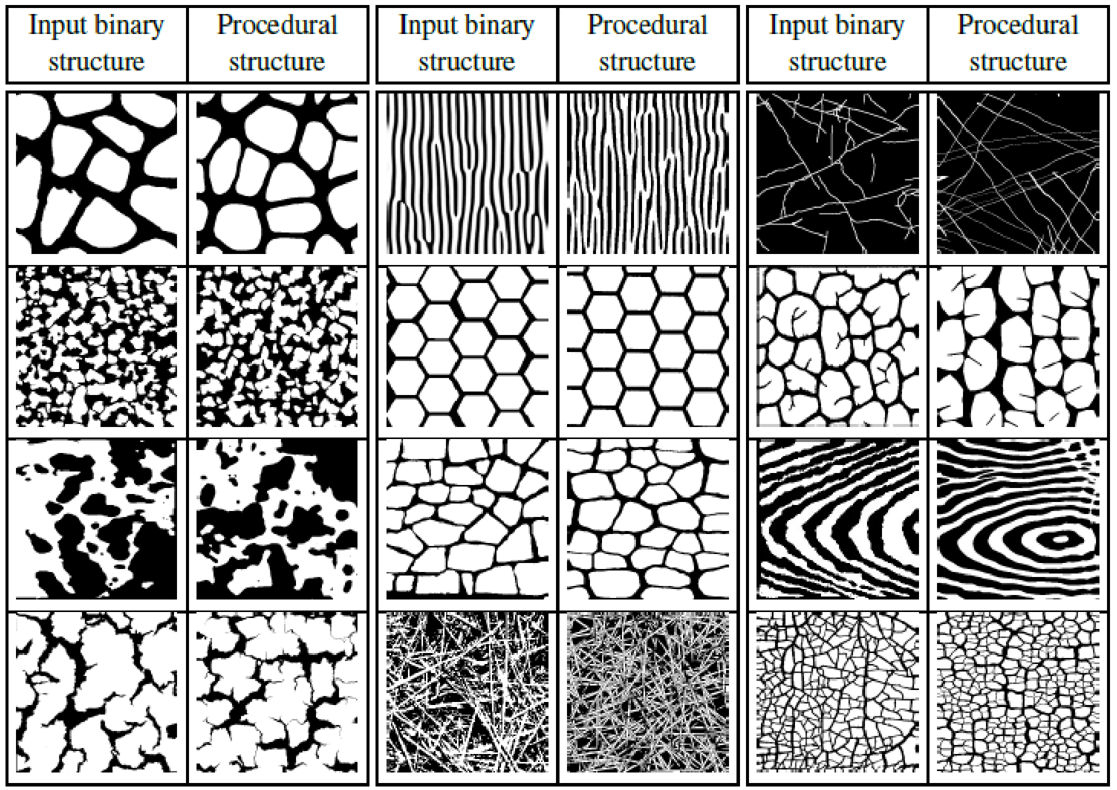


Figure 11: *Evaluation of the capability of PPTBF to produce natural structures (we use segmented images on left): parameters were estimated by querying a collection of 450k samples and by applying refinement.*

V. Compare results

Supplemental Material (extracted snapshots)

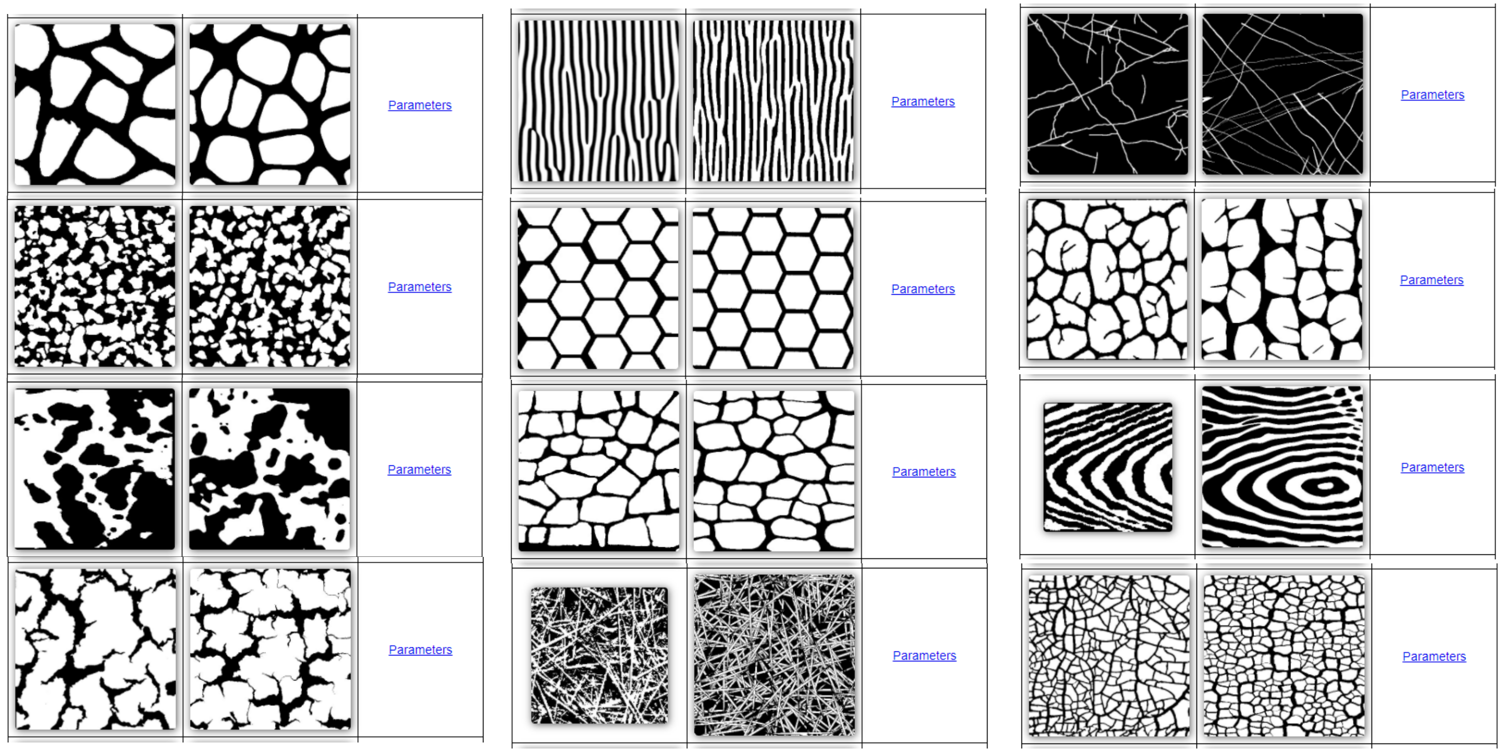


Figure 11 from article

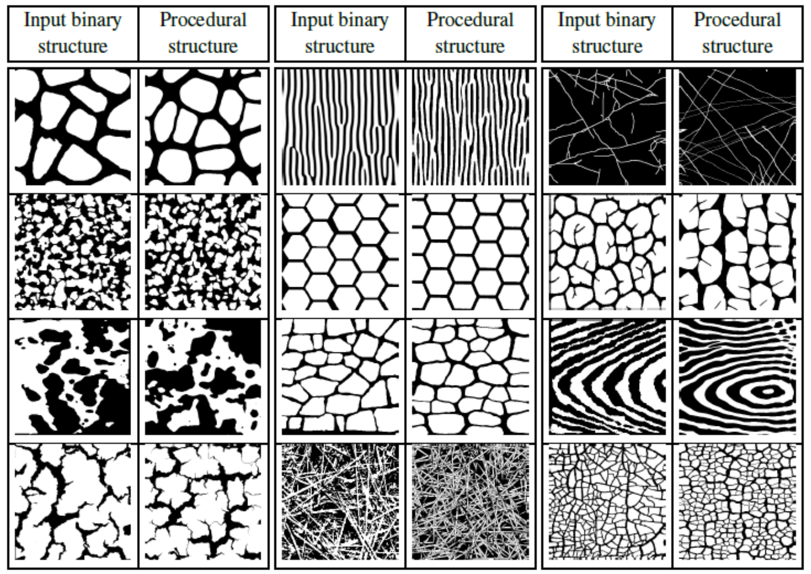


Figure 11: *Evaluation of the capability of PPTBF to produce natural structures (we use segmented images on left): parameters were estimated by querying a collection of 450k samples and by applying refinement.*

Generated Images: located in directory yourPath\Data\Matching_structures\

cells\20181215_153153_seg_scrop	lines\phasor_seg_scrop	networks\Marble_seg_scrop
dots\bumpy_hard_concrete_texture_9261475_seg_scrop	tilings\deephexa_seg_scrop	cells\14596343807_24e447963c_o_seg_scrop
maps\foam_texture_seg_scrop	cells\mosaicstones1_seg_scrop	grains\whiteash_seg_scrop
cells\mud_flakes_closeup_150326_seg_scrop	piles\straw_seg_scrop	cells\TexturesCom_Crackles0011_S_seg_scrop

IMPORTANT
On the left table, we display the directories where the 12 images to compare against figure 11 have been procedurally generated.