3D PRINTING DEFECT DETECTION REPORT

Input data

- **Input image:**

  Name: wrong_z_offset_honeycomb_box.jpg

  Size: (2048, 1537, 3) (height, width, channels) pixels.

- **Input Gcode:**

  Name: wrong_z_offset_honeycomb_box.gcode

- **Input reference object width:**

  23.21 millimeters

- **Input metadata:**

  No input metadata was inserted

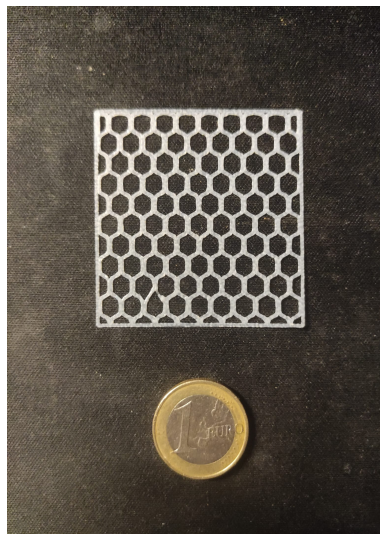# Impresion defects

· **Pixels per metric:**

   390.5 pixels per 23.21 millimeters

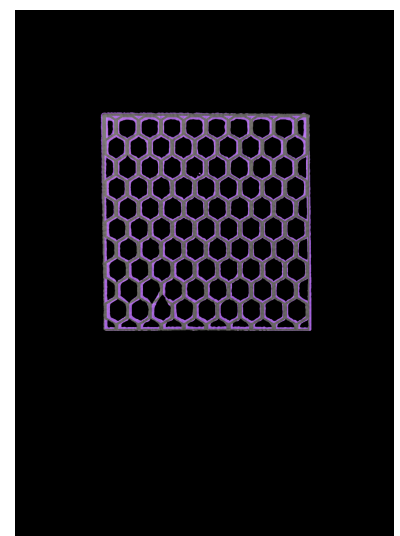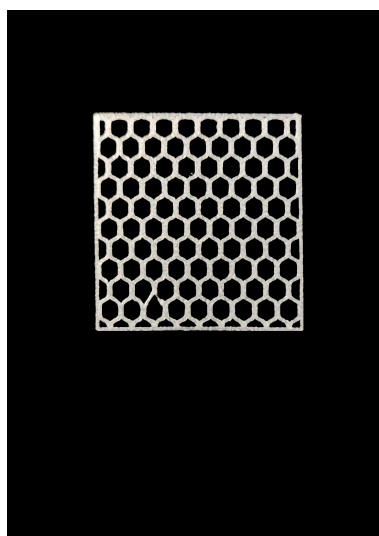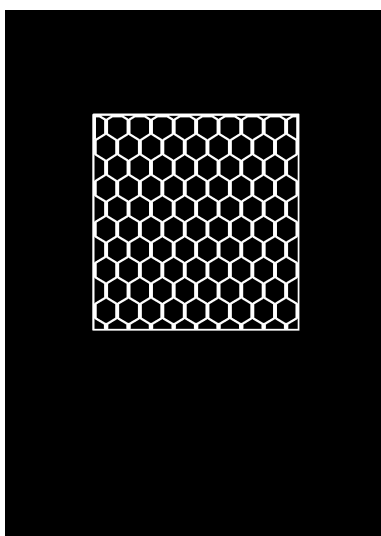· **Structural similarity index measure max score:**

   9.009E-1

· **Impresion total error:**

   9.912E-2

Original image, size: (2048, 1537, 3) (height, width, channels) pixels.

[Left] Perfect model, size: (2048, 1537, 3) (height, width, channels) pixels.

[Middle] Masked 3d printed object, size: (2048, 1537, 3) (height, width, channels) pixels.

[Right] Masked 3d printed object with defects, size (2048, 1537, 3) (height, width, channels) pixels.

Classification

· **Train and test images and labels lenght:**

- Train images: Using pretrained model

- Train labels: Using pretrained model

- Test images: 50

- Test labels: 50

· **Train and test pair images lenght:**

- Pair train images: Using pretrained model

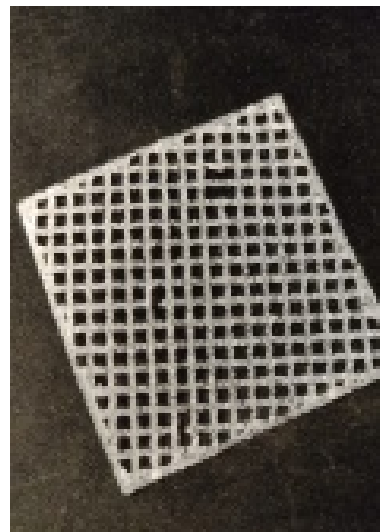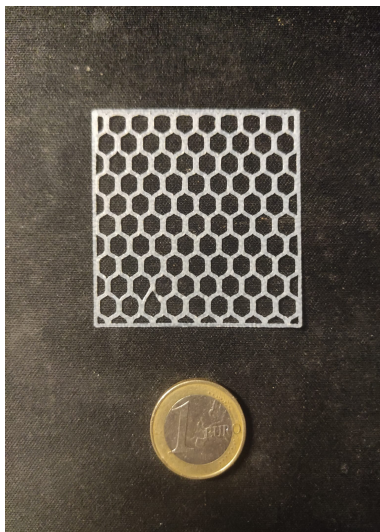- Pair test images: Using pretrained model

· **Model name:**

siamese_neural_network_model.keras

· **Model history:**

Using pretrained model

· **Defect classification:**

- Max similarity prediction: 75.0019 %

- Type of defect: Low Z-offset

[Left] Oringal image, size: (2048, 1537, 3) (height, width, channels) pixels.

[Right] Test image, size: (159, 120, 3) (height, width, channels) pixels.

· **Recomendations:**

- The print platform is not level.

- The Z-offset between the print platform and the extruder has not been correctly adjusted and it's too low.

- The diameter of the extruder may be affecting the Z-offset:

Extruders with larger diameters may require a larger Z-offset

due to the greater extrusion of material, while smaller ones may

require a smaller value.

- Different types of materials influence the Z-offset calibration:

Variable diameters of materials can affect the volume of

extrusion of the molten material.
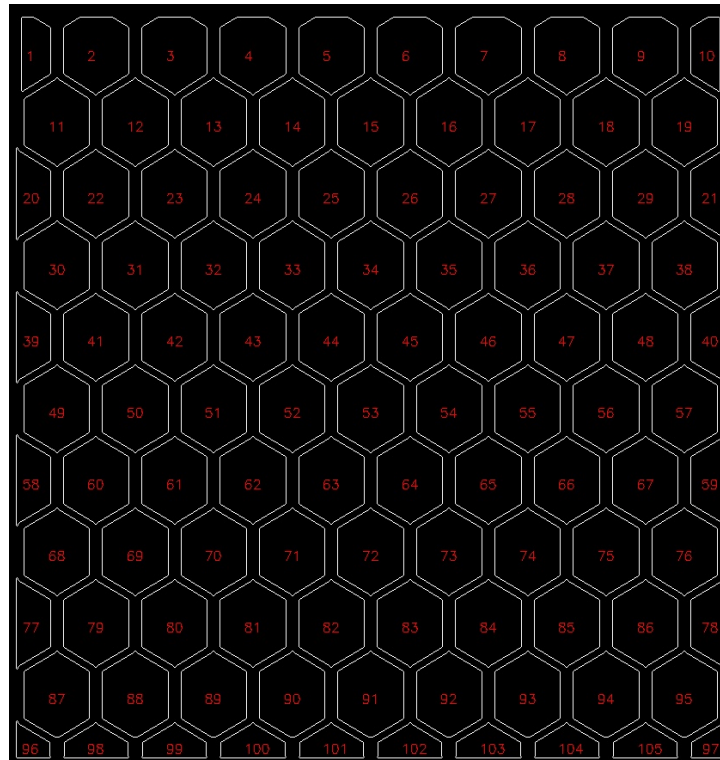
- Hardware problems:

It may have mechanical problems that affect the accuracy of the Z-offset.

Check for loose, misaligned or aged components that may affect

to the printing precision of the printer.

Internal areas

· **Structural similarity index measure max score:**

9.598E-1

· **List of areas (mm2):**

[1] 9.1225	[17] 21.8368	[33] 21.9568	[49] 21.7826	[65] 22.0574	[81] 22.0574
[2] 20.966	[18] 22.1155	[34] 22.2355	[50] 22.0574	[66] 21.7826	[82] 21.7826
[3] 20.966	[19] 21.8368	[35] 21.9568	[51] 21.7826	[67] 21.7826	[83] 21.7826
[4] 21.1943	[20] 11.6499	[36] 21.9568	[52] 21.7826	[68] 21.7826	[84] 22.0574
[5] 20.966	[21] 11.6499	[37] 22.2355	[53] 22.0574	[69] 22.0574	[85] 21.7826
[6] 20.966	[22] 21.8368	[38] 21.9568	[54] 21.7826	[70] 21.7826	[86] 21.7826
[7] 21.1943	[23] 21.8368	[39] 11.6151	[55] 21.7826	[71] 21.7826	[87] 21.7594
[8] 20.966	[24] 22.1155	[40] 11.6151	[56] 22.0574	[72] 22.0574	[88] 22.0342
[9] 20.966	[25] 21.8368	[41] 21.7826	[57] 21.7826	[73] 21.7826	[89] 21.7594
[10] 9.1225	[26] 21.8368	[42] 21.7826	[58] 11.6151	[74] 21.7826	[90] 21.7594
[11] 21.8368	[27] 22.1155	[43] 22.0574	[59] 11.6151	[75] 22.0574	[91] 22.0342
[12] 22.1155	[28] 21.8368	[44] 21.7826	[60] 21.7826	[76] 21.7826	[92] 21.7594
[13] 21.8368	[29] 21.8368	[45] 21.7826	[61] 21.7826	[77] 11.6151	[93] 21.7594
[14] 21.8368	[30] 21.9568	[46] 22.0574	[62] 22.0574	[78] 11.6151	[94] 22.0342
[15] 22.1155	[31] 22.2355	[47] 21.7826	[63] 21.7826	[79] 21.7826	[95] 21.7594
[16] 21.8368	[32] 21.9568	[48] 21.7826	[64] 21.7826	[80] 21.7826	[96] 4.2749

[97] 4.2749
[98] 7.9769
[99] 7.9769
[100] 8.0775
[101] 7.9769
[102] 7.9769
[103] 8.0775
[104] 7.9769
[105] 7.9769