Test Plan:
STEM Moiré GPA

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1 Revision History

Date	Version	Notes
Date 1	1.0	Notes

2 Symbols, Abbreviations and Acronyms

symbol	description
T	Test

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3 General Information

3.1 Purpose

The purpose of the document is to provide the plan for testing STEM Moiré GPA software.

3.2 Scope

3.3 Overview of Document

4 Plan

4.1 Software Description

STEM Moiré GPA software is converting STEM Moiré hologram into deformation maps. Details on the goal and the requirements of STEM Moiré GPA are provided in the Problem Statement and the SRS documents. Acronyms, symbols and terminologies used in the following document are the same as the ones in the SRS document.

4.2 Test Team

The author is the only member of the test team.

4.3 Automated Testing Approach

While interesting to implement, the automatic testing is not approached in STEM Moiré GPA program.

4.4 Verification Tools

4.5 Non-Testing Based Verification

5 System Test Description

5.1 Tests for Functional Requirements

5.1.1 Input Verification test

Test R2 in IM1

Test 1 Format-SMH

- ⋆ Type: Dynamical
- ⋆ Initial State: Waiting for $I_{SMH_{exp}}$ user input
- ⋆ Input: Various $I_{SMH_{exp}}$ improper format
- ⋆ Output: Error message $Err_{I_{SMH_{exp}}}$ should match: "Invalid STEM Moiré hologram format"

Test R6 in IM2

Test 2 Existence-Mask

- ⋆ Type: Functional
- ⋆ Initial State: Waiting for M user input on $\widetilde{I}_{SMH_{exp}}$
- ⋆ Input: M=$\emptyset$
- ⋆ Output: Error message Err_M should match: "No Mask found"

Test 3 Format-Mask

- ⋆ Type: Functional
- ⋆ Initial State: Waiting for M user input on $\widetilde{I}_{SMH_{exp}}$
- ⋆ Input: M improper format
- ⋆ Output: Error message Err_M should match: "Improper mask format"

Test R9 in IM3

Test 4 Existence-U

- ⋆ Type: Functional
- ⋆ Initial State: Waiting for U user input on $P_{\Delta\overrightarrow{g_j}^{Mexp}}$
- ⋆ Input: U=$\emptyset$
- ⋆ Output: Error message Err_U should match: "No reference in phase image found"

Test 5 Format-U

- ⋆ Type: Functional
- ⋆ Initial State: Waiting for U user input on $P_{\Delta\overrightarrow{g_j}^{Mexp}}$
- ⋆ Input: U improper format
- ⋆ Output: Error message Err_U should match: "Improper reference in phase image format"

5.1.2 Output Result test

Test R3

Test 6 bla

- ⋆ Type: Functional
- ⋆ Initial State:
- ⋆ Input:
- ⋆ Expected output
- ⋆ Output:

Test R7 in IM2

Test 7 Phase-Extraction-No-Strain

- ⋆ Type: Functional
- ⋆ Initial State:
- ⋆ Input: $I_{SMH_{exp}} = e^{2i\pi gx}$, Mask M of one pixel at $g\overrightarrow{u_x}$ in $\widetilde{I}_{SMH_{exp}}$
- ⋆ Expected output $P_{\Delta\overrightarrow{g_j}^{Mexp}} = 0$, $\Delta\overrightarrow{g_j}^{Mexp} = \overrightarrow{0}$,
- ⋆ Test output:${P_{\Delta\overrightarrow{g_j}^{Mexp}}}^t$, ${\Delta\overrightarrow{g_j}^{Mexp}}^t$
  - $\forall\vec{r} \in \mathbb{I},\ E_{P_{\Delta\overrightarrow{g_j}^{Mexp}}}(\vec{r}) = |{P_{\Delta\overrightarrow{g_j}^{Mexp}}}^t(\vec{r})|$
  - $\forall\vec{r} \in \mathbb{I},\ E_{\Delta\overrightarrow{g_j}^{Mexp}}(\vec{r}) = |{\Delta\overrightarrow{g_j}^{Mexp}}^t(\vec{r})|$

Test 8 Phase-Extraction-Known-Strain

- ⋆ Type: Functional
- ⋆ Initial State:
- ⋆ Input: $I_{SMH_{exp}} = e^{2i\pi(g+K(x))x}$, Mask M centred on $g\overrightarrow{u_x}$ in $\widetilde{I}_{SMH_{exp}}$ and with the minimum radius to include $K(x)$.
- ⋆ Expected output $P_{\Delta\overrightarrow{g_j}^{Mexp}} = K(x)x$, $\Delta\overrightarrow{g_j}^{Mexp} = K(x)\overrightarrow{u_x}$,
- ⋆ Test output:${P_{\Delta\overrightarrow{g_j}^{Mexp}}}^t$, ${\Delta\overrightarrow{g_j}^{Mexp}}^t$
  - $\forall\vec{r} \in \mathbb{I},\ E_{P_{\Delta\overrightarrow{g_j}^{Mexp}}}(\vec{r}) = |{P_{\Delta\overrightarrow{g_j}^{Mexp}}}^t(\vec{r}) - P_{\Delta\overrightarrow{g_j}^{Mexp}}(\vec{r})|$
  - $\forall\vec{r} \in \mathbb{I},\ E_{\Delta\overrightarrow{g_j}^{Mexp}}(\vec{r}) = |{\Delta\overrightarrow{g_j}^{Mexp}}^t(\vec{r}) - \Delta\overrightarrow{g_j}^{Mexp}(\vec{r})|$

Test 9 Phase-Extraction-Mask

- ⋆ Type: Functional
- ⋆ Initial State:
- ⋆ Input: $I_{SMH_{exp}} = e^{2i\pi(g+K(x))x}$, Mask M centred on $g\overrightarrow{u_x}$ in $\widetilde{I}_{SMH_{exp}}$ with different radius ϵ.

- ⋆ Expected output $P_{\Delta\overrightarrow{g_j}^{M_{exp}}} = K(x)x$, $\Delta\overrightarrow{g_j}^{M_{exp}} = K(x)\overrightarrow{u_x}$,
- ⋆ Test output:${P_{\Delta\overrightarrow{g_j}^{M_{exp}}}}^t$, ${\Delta\overrightarrow{g_j}^{M_{exp}}}^t$
  - $\forall\vec{r} \in \mathbb{I},\ E_{P_{\Delta\overrightarrow{g_j}^{M_{exp}}}}(\vec{r},\epsilon) = |{P_{\Delta\overrightarrow{g_j}^{M_{exp}}}}^t(\vec{r},\epsilon) - P_{\Delta\overrightarrow{g_j}^{M_{exp}}}(\vec{r})|$
  - $\forall\vec{r} \in \mathbb{I},\ E_{\Delta\overrightarrow{g_j}^{M_{exp}}}(\vec{r},\epsilon) = |{\Delta\overrightarrow{g_j}^{M_{exp}}}^t(\vec{r},\epsilon) - \Delta\overrightarrow{g_j}^{M_{exp}}(\vec{r})|$

Test R10

Test 10 bla

- ⋆ Type: Functional
- ⋆ Initial State:
- ⋆ Input:
- ⋆ Expected output
- ⋆ Output:

Test R11

Test 11 bla

- ⋆ Type: Functional
- ⋆ Initial State:
- ⋆ Input:
- ⋆ Expected output
- ⋆ Output:

Test R12

Test 12 bla

- ⋆ Type: Functional
- ⋆ Initial State:
- ⋆ Input:
- ⋆ Expected output
- ⋆ Output:

5.2 Tests for Nonfunctional Requirements

5.2.1 Area of Testing1

Test NR1

Test 13 bla

- ⋆ Type: Functional
- ⋆ Initial State:
- ⋆ Input:
- ⋆ Expected output
- ⋆ Output:

5.3 Traceability Between Test Cases and Requirements

6 Unit Testing Plan

7 Appendix

This is where you can place additional information.

7.1 Symbolic Parameters

The definition of the test cases will call for SYMBOLIC_CONSTANTS. Their values are defined in this section for easy maintenance.

7.2 Usability Survey Questions?

This is a section that would be appropriate for some teams.