**User Manual for CrackDigitizer Application**

CrackDigitizer is an internal application for reviewing crack detection results and establishing ground truth for crack map. It is capable of performing the following:

* Review cracking detected results from different algorithms (e.g., our algorithm, LCMS, etc.)
* Add/Delete/Edit joint
* Add/Delete/Edit crack (add crack using manual and semi-automatic 2-piont approach)
* Assign crack type for
* Calculate faulting along joint and crack

Note that the application can be used for cracking on the flexible and rigid pavement.

1. **How to setup CrackDigitizer**

* Install CrackDigitizer

Describe it’s installed with an exe and potentially who to contact to get the exe

* Set up data folder

CrackDigitizer displays range or intensity images (.jpg) as background, loads crack/joint from XML file, and use fis files for calculating faulting and crack width. In order for CrackDigitizer to find all the files, they need to be stored in a pre-defined folder structure. The following describe how to set up data folder that can be used by the Crack Digitizer.

**Required File System- set up in the same MAIN folder:**

Screen capture

|  |  |
| --- | --- |
| **3D** | **Folder that stores jpgs-raw data w/o rotation (output from certain configuration)** |
| **DB** | **Folder that stores Access database files** |
| **FC** | **Folder that stores Geo3D from image (files not required)** |
| **Intensity** | **Folder that stores jpgs** |
| LastManualOverlay | Folder used by Crack Detection program |
|  |  |
| ManualOverlay | Folder used by Crack Detection program |
| ManualXML | Default folder location to save manual xml files (files created after performing manual digitizing) |
| **Range** | **Folder that stores jpgs** |
| XML | Folder that stores automatic detection results, typically from LCMS |
| \_XML  (old version was XML\_Alg) | Folder that stores GT automatic detection results (xml files) |
| **LcmsData\_*filenumber*.fis** | **Individual LCMS fis files. They are typically 2 or 3 numbers ahead of the Geo3D jpg numbers.** |

Check with April

JointModule\_EnableJointOnMergedImage 0

1. **How to use CrackDigitizer**
2. Open-Preferences**:** Set Export Path and Method Preferences before opening files.

Set Export Path (default is ManualXML folder in same location as fis files). Best Practice: name Export Path and Manual Results Folder Path to the same Folder (ManualXML), this will overwrite any results in the ManualXML folder, so the latest results will always be in ManualXML.

Set Method Preferences as Priority 1: Manual, Priority 2: Chenglong, Priority 3: None

Capture the screen and briefly describe the concept.

1. Open-Open: Open fis files in MAIN Folder

**Legend:**

Capture the screen and label the legend

Joints are royal blue with orange borders

Cracks are colored light blue, green, or red based on width

Spalls are yellow

**Shortcuts:**

General

ZOOM: Hold down CTRL and scroll middle mouse button (scroll wheel) to zoom in and out

Note- scrolling without using CTRL changes the image frame and saves the image as is!

PAN: Hold down CTRL and hold down middle mouse button (scroll wheel) at same time and move mouse

RESET: to original view: Double click scroll button

Add practice for when to zoom in (e.g., for spalling)

DELETE FEATURE: Create a rectangle that encompasses the crack/joint by clicking a point on one side and dragging across the object to be deleted-then select ‘delete selected objects’ or click Delete key on keyboard

* Scroll bar

ADD JOINT: Click on one end of joint and other end of joint (only click 2 points), double left click to finish

Add practice for adding joint (e.g., within lane marking, need to a

ADD CRACK

* Set Draw to 2P (USE this in most cases, as the algorithm will automatically follow the crack)

: Click on one end of crack and other end of crack, (you can add intermediate points if the crack changes direction) double left-click to finish, need at least 3 points

* Set Draw to M (use in limited cases to create a crack)

ADD CRACK: Click on start point and major change points, double left -click on last point

EXTEND CRACK TO JOINT: Click end of crack and click at the outside joint edge (cannot click directly on joint)

CLOSE CRACK: double click on last point

ADD SPALL: Click on corner of spall, click on edges, double right-click back on first point to close in polygon

ESC: erases a crack before it is closed

Calculate Faulting

Calculate Crack Width

**Review Joint/Crack:**

Review button: Review objects to make sure they are identified correctly (i.e joint or crack, type of crack)

Joints: Make sure each joint is noted as a joint and that the number of joints noted match screen

Cracks: Make sure each crack is identified and if extends to joint that it is extended to joint (see shortcuts)

Spalls: Separately identify any spalls that are in the wheelpath or appear at least 4 times as large as a red crack

Check sides of the frame and make sure there are no cracks noted outside the slab- use the sliders to erase any outside false cracks, but do not hit any true cracks because it cannot be undone (crack will have to be redigitized)- **be sure to put slider back to outside before advancing to next image**

**Improvements/fixes**