Camera Trap Image Processing Program for Targets Crossing Linear Features (i.e. fence)

Semiautomated program operation

This document explains the step by step method for how we use the program used in our study.

1 Part 1- "Start Find Animal Program"

This step is used to manually assign regions that will be used for setting the automatic instruction for the next steps.

- Open "Start Find Animal Program" (Figure 1) Caution: clicking the exit button on any of the photos or the control panel will close all the windows and end the program.
- 2. Select desired pictures and press "open".
- 3. Half the resolution of the images twice, then make the background image. On the background image the regions can be selected by clicking the image in horizontal lines (top and bottom). The command prompt will indicate the values of the lines that were selected (Figure 2).
- 4. Return to the main folder for the program, right click on "Template" and click "edit". Find the below lines: <MouseClick><X>1</X><Y>0</Y></MouseClick>

```
<MouseClick><X>1</X><Y>0</Y></MouseClick>
<MouseClick><X>1</X><Y>0</Y></MouseClick>
<MouseClick><X>1</X><Y>0</Y></MouseClick>
```

Enter in the X and Y locations from the program, from the command

prompt where the 1s and 0s are. Other commands can be added or deleted to adjust the rule list as desired.

Save the file, using the name of the set that is being run followed

🙆 Select images	-	×			
Look <u>i</u> n: 🗖 C	ameraTrapNew				
Mule Deer					
🗂 Null 04 Problem					
Problem Pictures					
Problem Sets					
OLD_02_00280.jpg					
🗋 OLD_02_00281.jpg					
OLD_02_00282.jpg					
File <u>N</u> ame:					
Files of <u>Type</u> :	JPG & GIF Images	-			
		Open Cancel			

Figure 1: "Start Find Animal Program" start screen.

by .xml i.e. New01_2014_01.xml. This list will be used by the next program to automatically process the images.

Note: Each camera will need its own instruction set. Depending on the

movement of the camera between the files for each camera, individual instructions may be needed for each file.

🖆 Control			- 0 - X	
		Background Rules:		
Half Resolution	3x3 Gaussian Blur		BGD80A	
7x7 Gaussian Blur	Equalize Brightness	Animal Rules:	✓ BGDSUM60✓ BGDSUM75✓ BGDSUM70	
Deviation: 1.0 Make Difference Images	Make Background Image Compute Region Counts			
Threshold: 60	Threshold Difference Images	Sum 84%	 Green, Blue, Conditional Red No bin greater than 25% 	
3 Dilate Binary Image	Erode Binary Image Median Filter Difference Image	Sum 80% C	Peak 40% and 20%	
Invert Image	Del BG Fragments	✓ 1 Peak 80%, 2 Peaks 50%	 Peak 35%, 15%, no peak 0% A Peak 35%, 15%, no peak 0% B 	
Determine Eye Regions Horizon Height: 1536	Process Eyes Draw Horizon	 ✓ 4 peaks 10% A ✓ 4 peaks 10% B 	Peak 35%,15%, No Peak 9	
3	Box Blur	🗹 Two Peaks all Ranges A	 Peak 35%,15% 2 Peaks 1 Bin 	
V Night Time	Grey Scale	Two Peaks all Ranges B Night Background Rules:	✓ Sum 80 and 4 Blue Peaks	
Brighten]	Sum 80% Sum 90%	
			BGDAVG25	

Figure 2: Control screen.

2 Part 2- "Animal Image Processor"

This step sorts all the photos by time, runs through the program and assigns them a value and then exports the data into individual CSV. Files are then combined into a larger CSV file, the smaller files are then deleted.

- 1. Open "Animal Image Processor" (Figure 3)
- 2. Click "Add Image Files". Select all of the images to be run.
- 3. Click "Set Instruction File". Select the instruction file that was created in Part 1.
- 4. Set the Time Diff as 5 seconds. This indicates the maximum amount of time that can be between photos before they are considered to be from different sets. Max Pics/Set can be left at 50.

🛃 Animal Image Processor 📃 📼 🗮
Add Image Files
No instruction file selected.
Set Instruction File
Time Diff: 30 seconds
Max Pics/Set: 50
Start
Options: -Xmx512m -Xms256m -XX:MaxPermSize=512m
Output Names: Set *.csv

Figure 3: "Animal Image Processor" start screen.

- 5. Change the Output Name to the desired name for the set. Using the name of the File plus a extra underscore, ie. New03_2014_01_ is recommended.
- 6. Press Start. For detail instruction of how the program works please see Methods section.

3 Part 3- "Picture Mover"

For this part, folders are created that the images are sorted into based on the assigned ranking from the previous part.

- 1. Create a folder labeled after the file name. Create sub folders for the five directories. Directory 1 and 3 can be joined together, as can 4 and 5.
- 2. Open "Picture Mover" (Figure 4)

Picture Mover	- - X			
Add CSV Files				
Directory 1: C:\Users\mjanzen\Dropbox\CameraTrap\One	Change			
Directory 2: C:\Users\mjanzen\Dropbox\CameraTrap\Two	Change			
Directory 3: C:\Users\mjanzen\Dropbox\CameraTrap\Three	Change			
Directory 4: C:\Users\mjanzen\Dropbox\CameraTrap\Four	Change			
Directory 5: C:\Users\mjanzen\Dropbox\CameraTrap\Five	Change			
Start				

Figure 4: "Picture Mover" start screen.

- 3. Click "Add CSV Files". Select the final CSV file that was created in the last part.
- 4. Click "Change" to select the subfolders created in step 1.

5. Select "Start". The pictures will be moved into their selected files. The photos are then ready to be moved if needed to a computer that has the Reconyx software and analyzed.