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AutoMaxLair Documentation

Summary

AutoMaxLair is designed for shiny hunting legendary Pokemon in Dynamax Adventures found in Pokemon Sword and Shield: The Crown Tundra. The program runs on a computer connected to the switch through a Teensy 2.0 (outgoing controls to the Switch) and a HDMI capture card (incoming video from the Switch).

Required hardware

- Teensy 2.0 and USB to serial conversion device. See RemoteControl documentation for details.
- HDMI capture card or similar. You can also use a cheap USB device instead.
- A computer that you can run continuously for many hours.

Required software

- Tesseract
- Python 3 with the following packages installed (see requirements.txt for details):
    - opencv-python
    - pytesseract
    - pyenchant
    - pyserial
- Teensy Loader for programming the Teensy 2.0

Setup

1. Program the Teensy with RemoteControl.hex and plug it into the Switch.
2. Plug the USB cable attached to the Teensy's serial port into the computer.
3. Fill your inventory with Poke Balls so the bot can run uninterrupted.
4. Make sure the setting for automatically sending Pokemon to your box is turned on.
5. Go to the Max Lair and stop in front of the scientist, then disconnect the controller.
6. In Config.ini, modify the values to suit your setup. The bot will choose whatever legendary is at the top of your saved list.
7. Plug the HDMI of your switch into the capture card, but do not view the input from any other application (or else the bot will not be able to access the video).
8. Run AutoMaxLair.py, either directly or in the Python shell (which is better for debugging).
9. Check the placement of the coloured rectangles as show in Figure 1, Figure 2, Figure 3, Figure 4, and Figure 5. If the rectangle positions are off, correct them in MaxLairInstance.py by adjusting the values in the __init__ method. The changes will come into effect when the bot is restarted.

The bot will run until it finds a shiny legendary. Depending on the boss, it should take a day or two on average if you have the shiny charm (15 minutes per run, variable success rate but usually above 50%, 1/100 shiny chance for the legendary). It will also keep any other shiny Pokemon it finds but will continue running after. Figure 5 shows an example screenshot of the screen immediately before the program quits.

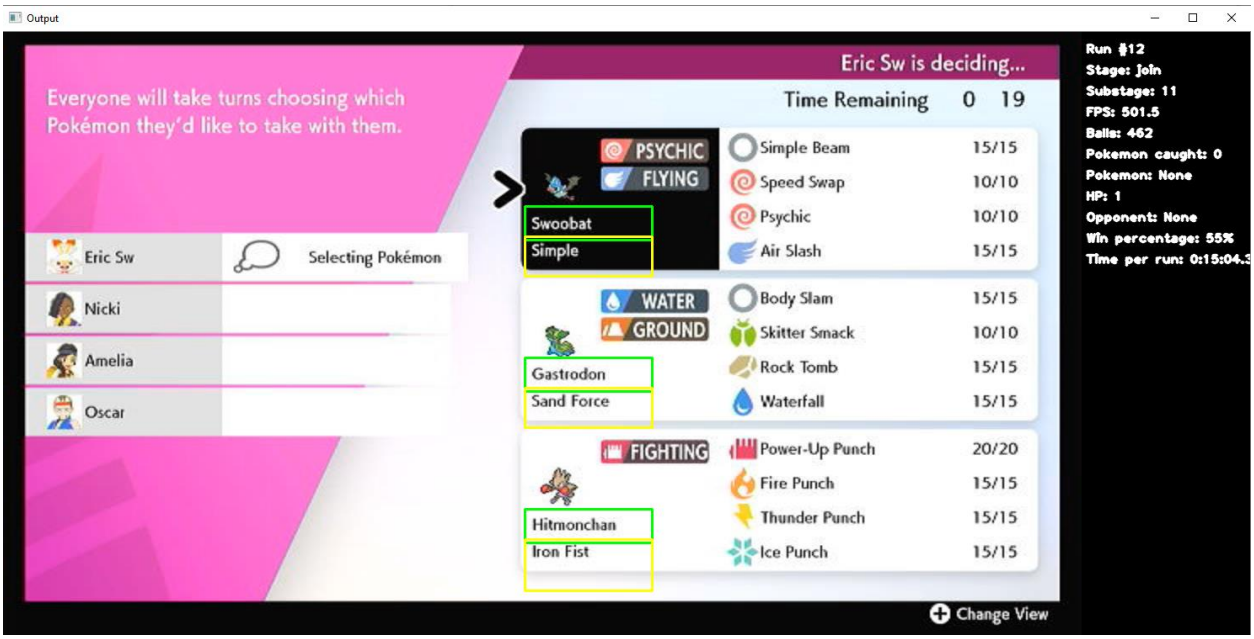

Figure 1: Screen capture of the initial Pokemon selection screen. The green rectangles should contain the full name of each Pokemon and the yellow rectangles should contain their abilities.

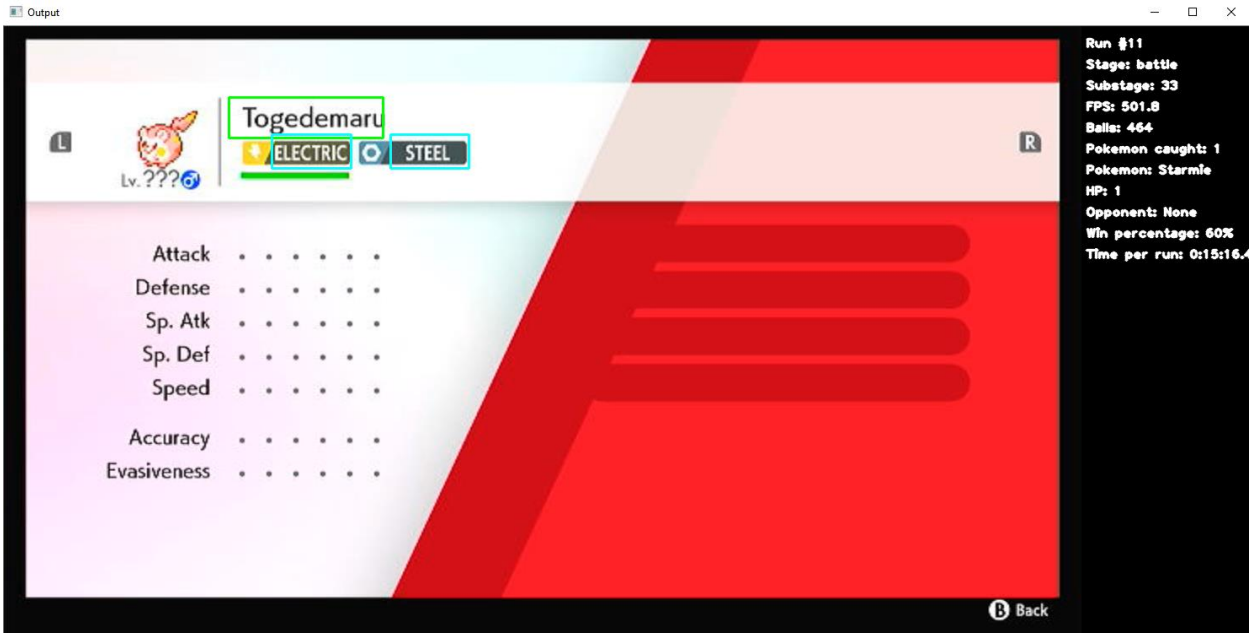

Figure 2: Screen capture of the in-battle opponent information screen. The green rectangle should contain the name of the Pokemon and the cyan rectangles should contain its types.

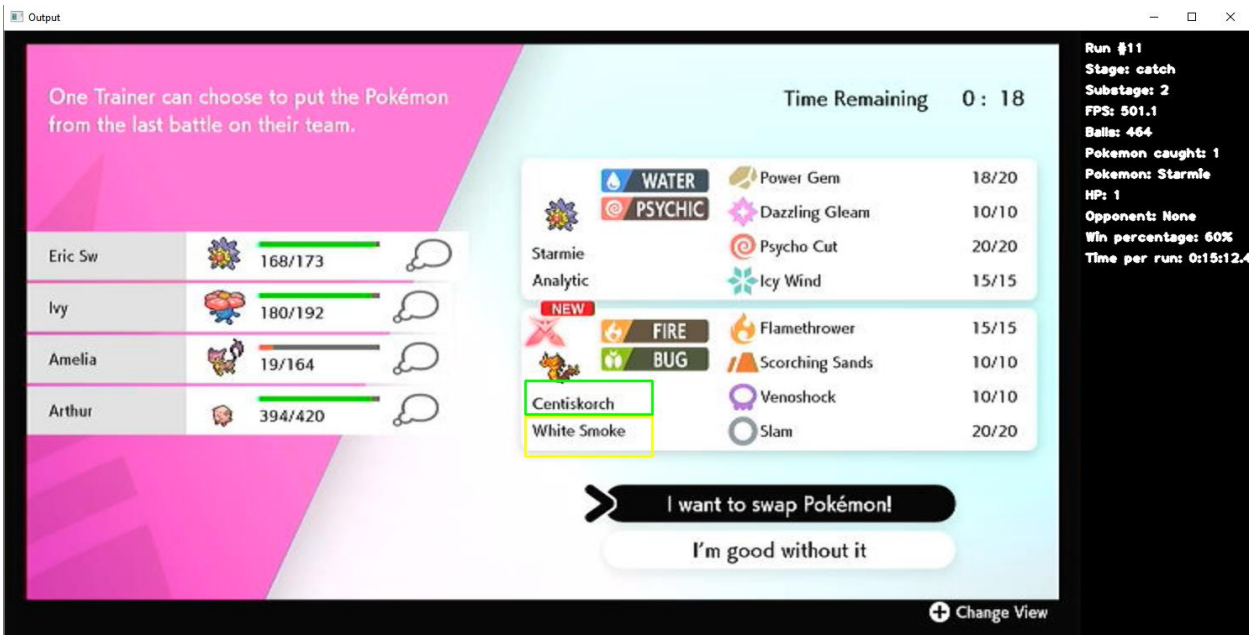

Figure 3: Screen capture of the mid-run Pokemon selection screen. The green rectangle should contain the full name of the new Pokemon and the yellow rectangle should contain its ability.

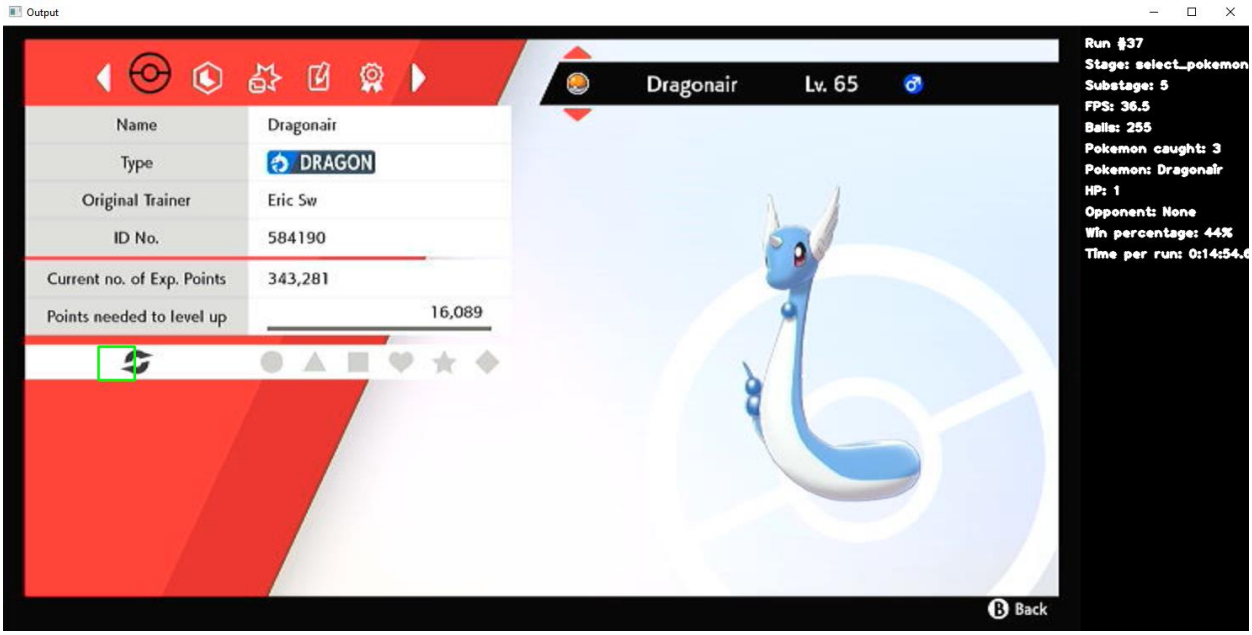

Figure 4: Screen capture of the Pokemon summary screen at the end of the run. The green rectangle will contain a red shiny sparkle symbol if the Pokemon is shiny. If it is not shiny, the rectangle will overlap slightly with the black symbol.

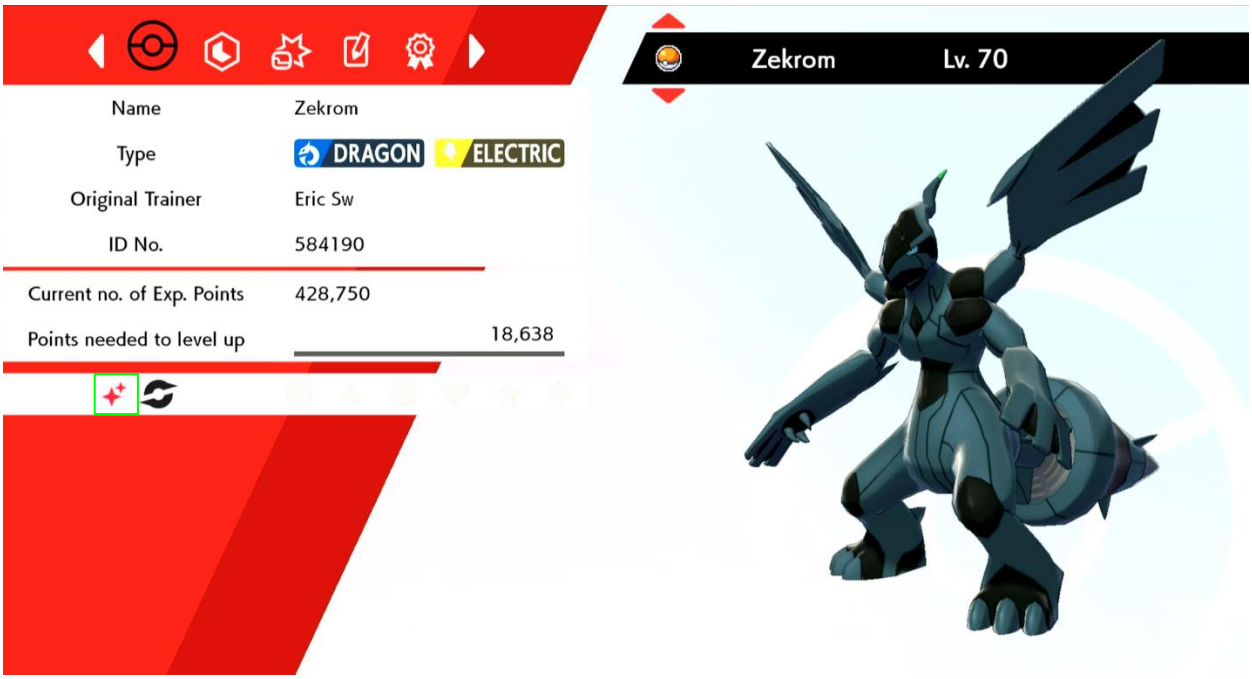

Figure 5: Screen capture saved at the end of a successful run. The bot detects the red shiny star on the left side of the screen. The program will quit if it detects the star while checking the legendary's summary; if the legendary is not shiny but Pokemon is, the program will take that shiny Pokemon and start another run.

To Do

Major Features

- Improved move selection
    - Certain bosses, such as Zygarde and Groudon, are extremely difficult to beat without Wide Guard. Updating the scoring algorithm to reflect this move's utility is almost certainly required for beating these bosses.
    - Stat changes, status, and field effects are not currently considered in damage calculations.
- Improved path selection
    - Intelligent path selection is not currently implemented—the default path (up the left side) is always used. This path is unlikely to be the optimal one, which could be a meaningful disadvantage if the boss is a difficult one.
- Improved selection of Pokemon
    - HP and status of the current Pokemon is not currently measured. This information could better inform decisions on whether to take a new Pokemon.
    - When considering a potential new Pokemon, only the player's current Pokemon is compared. The rest of the team could be considered to see whether another member would benefit more from the Pokemon.
- (Not sure if this idea is a good one) online capability
    - Connecting with other players online might be beneficial for having more intelligent teammates but may be inconsiderate if the bot makes poor choices.

Minor updates and bug fixes

- PP use is currently overestimated because the bot deducts PP when the move is selected as opposed to when it is used.
- Boss move usage is not fully reflected by their movesets.
    - Bosses use their 5th move only when at low HP with boss-dependent frequency and timing.
    - The 5th move of some bosses, including most Ultra Beasts, is currently not well documented and therefore not considered.
- Items are not chosen intelligently
    - Though the impact of this change is not enormous, better item selection from the backpacker would never hurt.