Implementation Details of paper 2

Overview of Implementation of this Repository

The RPG-Palm GitHub repo implements a framework for generating synthetic palmprints using a pretrained BicycleGAN model along with Bézier creases and their variants (for one identity, multiple variants with slightly shifted creases). This allows the creation of palmprint images with diverse characteristics, such as different lighting conditions. This approach enhances the diversity of the synthetic dataset, making it suitable for training robust palmprint recognition models.
Here is `GitHub Repo` link - `https://github.com/Shivam067/IPR_210980_Part2`

Training and Pretrained Models

The original authors trained the model from scratch using 13 different palmprint datasets, which are not publicly available. Since these datasets are inaccessible, I have used a pre-trained BicycleGAN model to generate synthetic palmprint images.

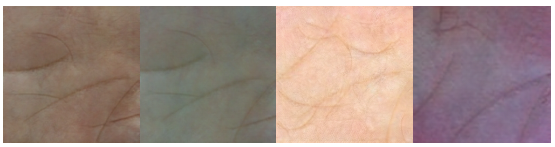
When you run the `run_rpg.sh` script, it creates the creases data (under `./datasets/bezier/test/`) using the `get_bezier.py` file. After that, it runs `script/split.py` to split the dataset into two parts (defined by `SPLITS` in the `run_rpg.sh` file) at locations `./datasets/bezier_0/test/` and `./datasets/bezier_1/test/`. Then it runs the `test.sh` script, which generates synthetic palm-print images using the pre-trained RPG model (results stored under `./bezier_rpg/`).

Bézier Creases and Resulting Images

An example of the **Bézier creases** generated by the model is shown below. These creases serve as input to the generator, conditioned with Gaussian noise to simulate variations in lighting and texture. The resulting palmprint images are realistic and diverse, as illustrated in the example output.

Examples of Bézier Creases

The resulting image is-



Resulting Synthetic Palmprint Images

Palmprint Recognition Model and Backbone Architectures

To evaluate the quality of the synthetic dataset, the authors tested the generated images on a palmprint recognition model using **ResNet-50** and **MobileFaceNet** as backbone architectures. However, this GitHub repo only implements the RPG model for generating palmprint images from Bézier creases and does not include these recognition models. The focus is on creating synthetic data rather than evaluating it.