safepedia

Technical Test – AI Engineer

Classification task: Minerals classification

1. Make an image classification model using Artificial Neural Network (ANN) or Deep Learning (DL) to classify image patches into 7 categories: biotite, bornite, chrysocolla, malachite, muscovite, pyrite, quartz.
2. You must make your own ANN/DL architecture and train it from scratch with provided dataset. Own means you are required to make the architecture on your own. You are allowed to create your own model architecture or using transfer learning (e.g. VGG16, Resnet, Inception, etc.) However, using concepts that is unique from a particular others architectures are allowed and you must at least mention (doesn't require to be like a scientific citation, e.g. URL is acceptable) your reference if you do to avoid plagiarism.
3. and any programming language (e.g. Python, C++, etc.) you like.
4. On inference phase, the classifier take input of tight image patches that is possibly a minerals. The tight image patches could be generated from region proposal network, motion detector, or positive samples and negative samples taken from object detection task dataset. For this case, we provide 1% of test dataset used to test the results of your work. Link to the test dataset examples: https://drive.google.com/drive/folders/1g7FYU62SThDRj5euhR2rUaYhqJ21dZtE?usp=sharing .
5. We provide you a dataset containing uncropped images and bounding box annotations file of the people. Positive samples and negative samples for training or validating your classifier could be extracted/generated from the provided dataset using your own samples extractor/generator. You are not allowed to add more training dataset from external sources. Link to the dataset: https://drive.google.com/file/d/1-ECLOkfloN6bd24mimgJsa6wiYC_nUpd/view?usp=sharing .
6. Share your work containing using Google Drive :
   a. Source code of your own ANN/DL architecture.

b. Source code for extracting/generating positive samples and negative samples from provided dataset. Generated positive samples and negative samples are unnecessary to be shared.

c. Source code for training. You are allowed to use your own training scripts, or publicly available training scripts usually provided by ML framework or 3rd parties.

d. Source code of your very own inferencing scripts for inferencing test image dataset along with predetermined confidence threshold. Inference results dumped into a JSON file containing sets of filename as key, confidence as value and result as value. Real deployment case grade source code is a plus. Live preview of inferenced image and inference result is not necessary.

e. Training result files (e.g. checkpoints, weights, network graph, etc) of your ANN/DL model.

f. A readme.txt file containing at least requirements and step-by-step of how to run your work, so that we could reproduce your work for testing and verifying purpose.

g. Documentation of your work as PDF containing at least:
   i. Your very own ANN/DL architecture and the descriptions.
   ii. Your strategy to generate positive samples and negative samples.
   iii. Your strategy for training your model.
   iv. Your strategy for optimally inferencing your model.
   v. Snapshots, example results, or example video of your ANN/DL model inference running process.

h. Bonus (not mandatory): you could also provide a source code to quantitatively measure the performance of your model using the correct performance metrics for classification problems.

7. You are not allowed to publish your work to the public nor to other parties outside of this technical test scope.

Please send your technical test submission by attaching the documents or link by replying the email.

- GOOD LUCK! -