AI-powered Verification Flow

Veriff is building an online identity verification product. From a technical perspective, Veriff is collecting images of our end users and images of their documents. Based on these images we need to determine whether a person has a valid government-issued document and whether they are the document's real owner. The automation team at Veriff is tasked with automating the online identity verification product. Whether automatic or manual, the task of verifying an identity can be broken down into separate smaller tasks. At first, we want to answer simple questions:

1. Is there a document in the image?
2. Is there a face?
3. If the document exists then what's written on it?

As we want to give our customers a more profound identity verification we will also need to answer questions like:

1. What security features can we detect and verify?
2. Is the person in the image conscious?
3. Could they be coerced into verifying their identity?

In order to answer these questions without human intervention, Veriff has developed several ML models. Ranging from regression and tree-based models to various deep learning algorithms such as CNN, LSTM, RNN, and GANs. For this task, please assume that Veriff has a check-based framework of verifying identities and assume that machine learning is the correct tool to help automate identity verification.

We encourage you to visit our website www.veriff.com and learn more about how our verification flow works.

ML Research Engineer Test Tasks

These test tasks are designed to give you a sneak-peak into your daily work at Veriff. Please take this as an opportunity to experience how you will help us build the AI that fuels Veriff's engine!

There are two test tasks you need to complete in this step: one technical presentation and one practical coding task. Once you submit your practical coding task, we will schedule a meeting with your future team members for your presentation. In this meeting, you will also have the opportunity to discuss your practical task and get feedback from the team.

We know that everyone has their unique way of working. Take as much time as needed but mind the given deadline. We do not expect you to spend more than a few days on these tasks.

1. Paper Reading Club

Keeping up with the latest advancements in Machine Learning Research is at the very core of this role. Our team holds regular paper reading sessions and we believe you will be a great addition to our club. For this task, we expect you to prepare a **10-minute** presentation on one of the suggested research papers below. At the end of your presentation, we will hold a short Q&A session.

A perfect presentation will:

- Focus on the applicability of the presented work on a real-world solution
- Discuss the potential value it might bring to Veriff's identity verification product.
- Emphasize the key ideas of the paper and skip over what is standard, obvious, or merely complicated.
- Be prepared at the right level – your audience will be data scientists.

Understanding self-supervised Learning Dynamics without Contrastive Pairs

Yuandong Tian, Xinlei Chen, Surya Ganguli

Less is More: ClipBERT for Video-and-Language Learning via Sparse Sampling

Jie Lei, Linjie Li, Luowei Zhou, Zhe Gan, Tamara L. Berg, Mohit Bansal, Jingjing Liu

IIRC: Incremental Implicitly-Refined Classification

Mohamed Abdelsalam, Mojtaba Faramarzi, Shagun Sodhani, Sarath Chandar

A Multiplexed Network for End-to-End, Multilingual OCR

Jing Huang, Guan Pang, Rama Kovvuri, Mandy Toh, Kevin J Liang, Praveen Krishnan, Xi Yin, Tal Hassner

2. From Idea to Implementation

In this task, you will implement a visual attention mechanism called Spatial Transformer Networks (STN for short). You can read more about the spatial transformer networks in this DeepMind paper. STNs allows a neural network to perform spatial manipulation on the input data within the network to enhance the geometric invariance of the model. It can be a useful mechanism because CNNs are not invariant to rotation and scale and more general affine transformations. STNs can be simply inserted into existing convolutional architectures without any extra training supervision or modification to the optimization process. This PyTorch tutorial might help you kick off this task. Please use this implementation as a baseline.

As the next step, let's investigate if using `CoordConv` layers instead of standard `Conv` will help to improve the performance of our baseline. Compare the performance of the new model in your preferred evaluation metric and motivate the choice of metrics. `CoordConv` works by giving convolution operation access to its input coordinates through the use of extra coordinate channels. You can read more about the `CoordConv` solution in this Uber AI paper.

The last step of this task is where you can show us your creativity and how you differentiate from other candidates. STN is an emerging topic in the vision and learning communities. Explore the latest advancements and new ideas that might achieve better performance than conventional STNs. There is no single solution for this task. Your objective should be to help us understand how you approach converting an idea to an experiment – not achieving a SOTA model. You will later have the opportunity to discuss your work in more detail with your future team.

You should respond to the email with a URL to a publicly accessible GitHub repository of your solution. Please note that we will evaluate your solution also based on code quality, readability, and implementation of best practices. Reproducibility and documentation of your solution are of equivalent importance as the solution itself. Note that all external resources should be properly cited.