Diabetic Foot Ulcer Grand Challenge 2024 (DFUC 2024)
Website: https://dfu-challenge.github.io/

To take part, please apply for the licence agreement, obtain the licence agreement ID, and complete the registration form.

Abstract
Diabetes is a global epidemic affecting approximately 537 million people [1]. This figure is expected to rise to 783 million people by 2045 [1]. Diabetic Foot Ulcers (DFU) are a serious condition that frequently results from the disease. The rapid rise of the condition over the last few decades is a major challenge for healthcare systems around the world. Cases of DFU frequently lead to more serious conditions such as infection and ischaemia that can significantly prolong treatment and often result in limb amputation, with more serious cases leading to death. The ability to estimate the area of ulcer regions and its pathology are important aspects in DFU management [2]. Manual delineation of ulcer regions is very time-consuming and challenging for podiatrists. In an effort to improve patient care and reduce the strain on healthcare systems, recent research has focused on the creation of detection algorithms that could be used as part of a mobile app that patients could use themselves (or a carer/partner) to monitor their condition and to detect the appearance of DFU [3-5]. To this end, the collaborative work between Manchester Metropolitan University, Lancashire Teaching Hospitals and the Manchester University NHS Foundation Trust has created an international repository of up to 11,000 DFU images for the purpose of supporting more advanced methods of DFU research. With joint effort from the lead scientists of the UK, US, India and New Zealand, three challenges on DFU detection [3,4], DFU classification [6,7] and DFU segmentation [8] were successfully conducted. This year's challenge will explicitly focus on self-supervised instance segmentation, which will automate the segmentation of each ulcer region using self-supervised learning methods. In addition to original DFU wound images, a curated dataset extension of generated DFU images [9] is also provided. The synthetically generated images have been included to encourage utilisation of synthetic data and exploration of model optimisation potential. This event will solicit original works in DFU deep learning research and promote interactions between interdisciplinary researchers.

Challenge Keywords
diabetic foot ulcers, self-supervised learning, deep learning, instance segmentation, synthetic images

TASK: Self-supervised Instance Segmentation of Diabetic Foot Ulcers

Data Usage Agreement
Prospective participants will need to request the dataset by completing a license agreement and emailing a formal request to the data owners.

We will provide an online platform to evaluate the results. The validation stage is available from the 22nd June 2024 with 200 images, and the testing stage (planned on the 1st July 2024) will contain 2000 images.

Datasets:
Training: 2000 DFU original images and 2000 DFU synthetic images (categorised by instance size)
Validation: 200 images
Testing: 2000 images

Additional comments: Participants can use other publicly available foot ulcer segmentation datasets (optionally use for training). However, the source must be made available and the solution must be fully automated with a self-supervised learning method.

Assessment Method:
Participants are challenged to create an algorithm to segment DFU regions from medical images, explicitly relying of self-supervised learning methods. This competition will evaluate the similarity between the predicted contours produced by computer algorithms and the ground truth contours produced by the domain experts. The Dice similarity coefficient (DSC) is widely used to compare the pixel-wise agreement between a predicted segmentation (X) and its corresponding ground truth (Y). The DSC is defined to be 1 when both X and Y have a 100% overlap (similar). The leader board score is the mean of the DSC for each image in the test set. Other metrics include Intersect over Union (IoU), False Negative Error (FNE) and False Positive Error (FPE).

Submission Method
For the purpose of result verification and to encourage reproducibility and transparency, all entries must submit the following:
- Mask images indicating image id, with pixel-wise label for background (0), ulcer region (1). This is to ensure that all submissions are fairly and correctly evaluated for comparisons.
- A paper highlighting the contribution of the submission, but not limited to, the method, experimental results and analysis, prepared according to the format stipulated by MICCAI 2024. All challenge entries should be accompanied by a description of the method. The submission link will be made available from the 1st July 2024.
- GitHub repository URL containing all source code for their implemented method, and all other relevant files such as feature/parameter data. To help publicise our workshop and domain area, please mention (or add relevant links to) DFUC 2024 and MICCAI 2024. Participants may provide this URL in a simple text file while submitting. For all files, participants should submit a single zip file and upload to the submission system as supplementary material.

The challenge organisers will publish at least one challenge research article (such as in [8]) and potentially more. With the publication of DFUC2022 MICCAI Challenge Proceedings, we will seek continue to submit a proposal for the DFUC2024 MICCAI Challenge Proceedings.

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