# MICCAI 2024 Challenge Kits: Empowering Innovation in Medical Image Computing

The Medical Image Computing and Computer Assisted Intervention (MICCAI) conference is the premier international forum for the presentation of the latest research in medical image computing and related fields. The MICCAI 2024 conference will be held in Strasbourg, France, from September 27 to October 1, 2024.

As part of the MICCAI 2024 conference, the MICCAI Challenge Kits will be held. The MICCAI Challenge Kits are a series of competitions that challenge participants to develop innovative solutions to real-world medical image computing problems. The Challenge Kits provide participants with access to high-quality datasets and evaluation metrics, and they offer a unique opportunity to benchmark their algorithms against the state-of-the-art.
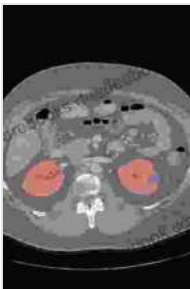
Kidney and Kidney Tumor Segmentation: MICCAI 2024 Challenge, KiTS 2024, Held in Conjunction with MICCAI 2024, Strasbourg, France, September 27, 2024, Proceedings ... Notes in Computer Science Book 13168) by Nicolas Barreau

⭐⭐⭐⭐⭐   5 out of 5

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Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Print length	: 280 pages

Challenge Kit Descriptions

The MICCAI 2024 Challenge Kits will feature a variety of different datasets and tasks, covering a wide range of medical image computing applications. The following is a brief overview of each of the Challenge Kits:

- **Cardiac Segmentation Challenge:** This challenge focuses on the segmentation of cardiac structures from medical images. The dataset consists of cardiac MRI scans from patients with various heart conditions. Participants will be tasked with developing algorithms that can accurately segment the left ventricle, right ventricle, and other cardiac structures.

- **Pulmonary Segmentation Challenge:** This challenge focuses on the segmentation of pulmonary structures from medical images. The dataset consists of chest CT scans from patients with various lung diseases. Participants will be tasked with developing algorithms that can accurately segment the lungs, airways, and other pulmonary structures.

- **Abdominal Segmentation Challenge:** This challenge focuses on the segmentation of abdominal organs from medical images. The dataset consists of abdominal CT scans from patients with various abdominal conditions. Participants will be tasked with developing algorithms that can accurately segment the liver, spleen, kidneys, and other abdominal organs.

- **Brain Tumor Segmentation Challenge:** This challenge focuses on the segmentation of brain tumors from medical images. The dataset

consists of MRI scans from patients with brain tumors. Participants will be tasked with developing algorithms that can accurately segment the tumor, edema, and other tumor-related structures.

- **Medical Image Classification Challenge:** This challenge focuses on the classification of medical images. The dataset consists of a variety of medical images, including X-rays, CT scans, and MRI scans. Participants will be tasked with developing algorithms that can accurately classify the images into different categories, such as normal, abnormal, or cancerous.

- **Medical Image Registration Challenge:** This challenge focuses on the registration of medical images. The dataset consists of pairs of medical images that have been acquired from different sources or at different times. Participants will be tasked with developing algorithms that can accurately register the images to each other.

- **Medical Image Reconstruction Challenge:** This challenge focuses on the reconstruction of medical images from incomplete or noisy data. The dataset consists of incomplete or noisy medical images. Participants will be tasked with developing algorithms that can accurately reconstruct the original images.

Evaluation Metrics

The MICCAI 2024 Challenge Kits will use a variety of evaluation metrics to assess the performance of the participants' algorithms. The following is a brief overview of each of the evaluation metrics:

- **Dice coefficient:** The Dice coefficient is a measure of the overlap between two binary masks. It is calculated as the ratio of the number

of pixels that are common to both masks to the number of pixels in both masks.

- **Hausdorff distance:** The Hausdorff distance is a measure of the distance between two sets of points. It is calculated as the maximum distance from any point in one set to the nearest point in the other set.

- **Mean absolute error:** The mean absolute error is a measure of the difference between two sets of values. It is calculated as the average of the absolute differences between the values in the two sets.

- **Mean squared error:** The mean squared error is a measure of the difference between two sets of values. It is calculated as the average of the squared differences between the values in the two sets.

- **Accuracy:** Accuracy is a measure of the proportion of correct predictions made by a classifier. It is calculated as the ratio of the number of correct predictions to the total number of predictions.

- **Specificity:** Specificity is a measure of the proportion of negative predictions that are correct. It is calculated as the ratio of the number of correct negative predictions to the total number of negative predictions.

- **Sensitivity:** Sensitivity is a measure of the proportion of positive predictions that are correct. It is calculated as the ratio of the number of correct positive predictions to the total number of positive predictions.

Important Dates

The following are the important dates for the MICCAI 2024 Challenge Kits:

- **Challenge Kit Registration Deadline:** April 15, 2024

- **Dataset Release Date:** May 1, 2024

- **Challenge Kit Submission Deadline:** August 15, 2024

- **Challenge Kit Results Announcement:** September 15, 2024

Prizes

The winners of the MICCAI 2024 Challenge Kits will receive a variety of prizes, including:

- **Cash prizes:** The top three teams in each Challenge Kit will receive cash prizes of $10,000, $5,000, and $2,500, respectively.

- **Travel grants:** The top teams in each Challenge Kit will receive travel grants to attend the MICCAI 2024 conference.

- **Publication opportunities:** The top teams in each Challenge Kit will be invited to publish their work in the MICCAI 2024 conference proceedings.

How to Participate

To participate in the MICCAI 2024 Challenge Kits, you must first register for the challenge. You can register for the challenge by visiting the MICCAI 2024 website. Once you have registered for the challenge, you will be able to download the dataset and submit your results.

The MICCAI 2024 Challenge Kits offer a unique opportunity to benchmark your algorithms against the state-of-the-art in medical image computing. The challenge kits provide access to high-quality datasets and evaluation

metrics, and they offer a variety of prizes for the top teams. If you are interested in participating in the challenge kits, we encourage you to visit the MICCAI 2024 website for more information.
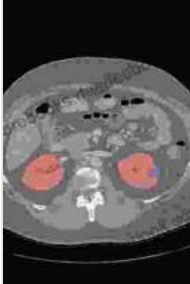
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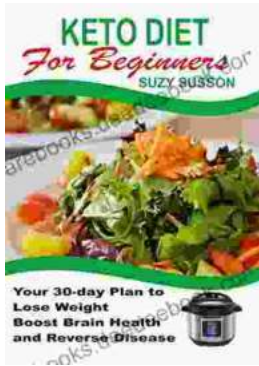
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