Inter IIT Tech Meet 11.0
IIT Kanpur

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Mid Prep

THE VITAL EXTRACTION CHALLENGE

Patient monitoring is a crucial aspect of healthcare, as it allows healthcare professionals to closely track a patient's vital signs and detect any potential issues before they become serious. In particular, monitoring a patient's vitals, such as heart rate, blood pressure, and oxygen levels can provide valuable information about a patient's overall health and well-being.

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INTRODUCTION

Patient monitoring is a crucial aspect of healthcare, as it allows healthcare professionals to closely track a patient's vital signs and detect any potential issues before they become serious. In particular, monitoring a patient's vitals, such as heart rate, blood pressure, and oxygen levels can provide valuable information about a patient's overall health and well-being. By closely monitoring vitals, healthcare professionals can quickly identify any abnormal changes, and take appropriate action to address any concerns. Additionally, with the increasing use of technology in healthcare, there are now many digital monitoring systems available that can help to automate the process of tracking vitals, making it more efficient and accurate. Overall, monitoring vitals is a critical aspect of providing high-quality care to patients and is essential for ensuring the best possible patient outcomes. According to the current guidelines, the nurse-to-patient ratio is 1:6, however, in the real world, the situation is much worse.

Cloudphysician is a healthcare company focused on bringing quality critical care within reach of every patient, wherever they may be. Cloudphysician's Smart-ICU solution has helped manage ICUs at over 70 hospitals across India and has served over 50,000 critically ill patients with a marked improvement in outcomes, a reduction in mortality rates, and greater compliance with the standard of care protocols. Cloudphysician's team of critical care specialists includes intensivists, trained critical care nurses, dietitians, and clinical pharmacologists. From its Care Center in Bengaluru, this critical care specialist team uses Cloudphysician's Smart-ICU platform, RADAR, to monitor and manage patients 24/7 and provide real-time inputs per global standards. Their clinical team, with the help of RADAR, makes quality healthcare accessible to everyone, everywhere.

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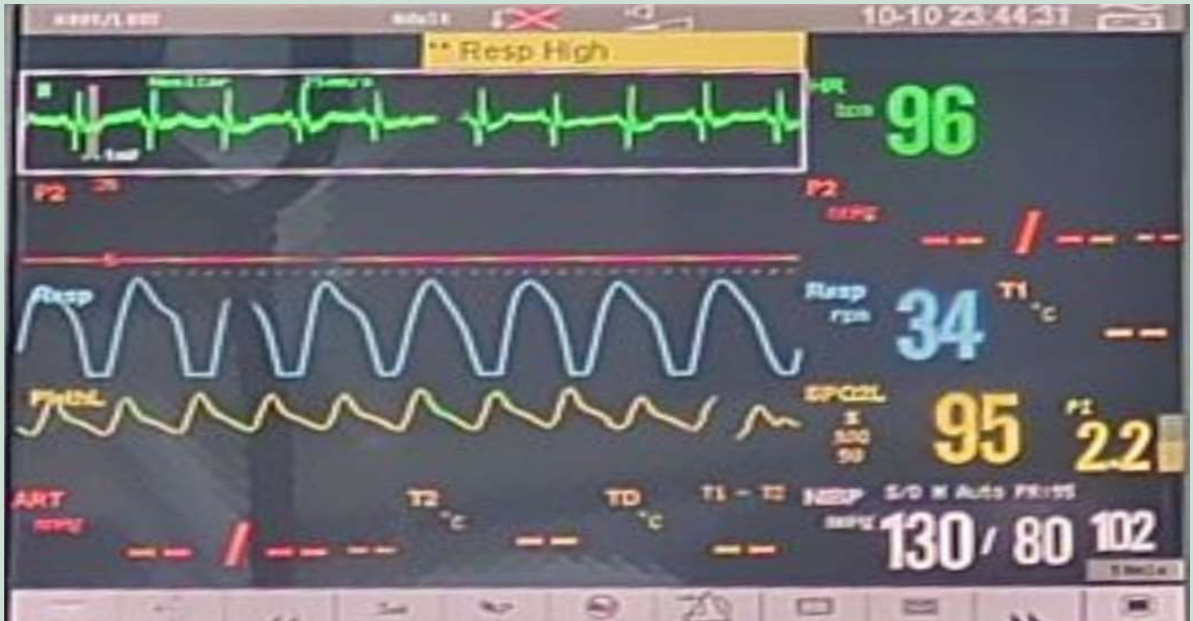
PROBLEM STATEMENT

The core problem statement is to extract Heart Rate, SpO2, RR, Systolic Blood Pressure, Diabolic Blood Pressure, and MAP from the provided images.

The provided images look like the following image:

A close up of the above image looks like the following:



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EVALUATION METRICS

The evaluation metrics include the following:

Accuracy of the extracted information - 60%

Inference time of the entire pipeline - 10%

Novelty - 30%

Brownie points to teams that ***detect the H.R graph and digitize it***.

DATA PROVIDED

Monitor Segmentation Dataset - A dataset containing the segmentation boundaries for the monitors in the image, a total of 2000 images.

https://drive.google.com/drive/folders/1qCcqEEeTXO9t7dAmG09_IpXXS3S_1tfP?usp=share_link

Classification Dataset - The monitors present in the images can be grouped into 4 types, based on some screen characteristics. This is a separate dataset with the monitors classified into those 4 separate types, a total of 250 images per class, accounting for 1000 images.

Unlabelled Dataset - A total of 7000 unlabelled images. Can you use this data to make your model better?

The above two datasets will be provided soon.