# Motion Matters: Neural Motion Transfer for Better Camera Physiological Sensing

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## Introduction

Motion is a significant source of noise in the remote PPG sensing task.

## Method

### 1. Setup & Problem Definition

- **Example Video Frames**
- **Video PPG Trends**
- **Video PPG Spectrum**

### 2. Motion Augmentation Pipeline

- **Source Video w/ Gold-Standard PPG**
- **Driving Video w/ Distorted Motion**
- **Augmented Video w/ PPG**

- **Motion Augmentation Pipeline**

### Results

- **Light Reflected By Skin**
- **Light Absorbed By Skin**

## Problem

### rPPG Videos

Motion is a significant source of noise in the remote PPG sensing task.

### FPPG Videos

Collecting rPPG datasets with significant motion is inherently challenging.

### Talking Head Videos

Obtain natural motion from videos of people on the Internet

Synthetically add motion variation into existing rPPG training datasets

## Solution

- **Apply keypoint-based motion transfer as a data augmentation technique for training data.**

  Source videos are augmented while preserving 1) identity and 2) the underlying PPG signal.

## Conclusion

1. Can motion augmentation achieve SOTA results? - Yes!
2. What type of motion is best to augment? - Depends on the test data and more is generally better!
3. Is natural motion augmentation best? - Yes!

Find our project website, pre-print, and code using this QR code: