# Applying Deep Learning to Establish A Telemedicine Assistance System: A Case Study of the Stage Classification of Pressure Injuries

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**Abstract.** The current medical system still uses manual work for the assessment of pressure injuries. For medical staff, it consumes lots of time and energy, and is difficult to maintain a consistent judgment. In recent years, Covid-19 has worsened the shortage of medical resources and manpower, and has promoted telemedicine. However, limited by the inability to actually touch the affected part of the patient, the medical staff will also have deviations in the judgment of the wound, which will affect the treatment effect. At present, there are only a few studies on the stage identification of pressure injuries, and the accuracy is unsatisfactory. Therefore, this study aims to establish a telemedicine assistance system based on YOLOv7, which is a deep learning model with classification and real-time judgment ability. The front-end interface of this system includes iOS, Android, and Web pages to address the shortcomings of previous studies and provide more real-time pressure injuries wound information in the process of telemedicine. The contributions of this research include providing an available pressure injuries stage classification model with a classification F1 Score value of 0.9246, which can support medical staff to make quick and accurate decisions clinically, and carry out corresponding medical measures according to each stage of symptoms; and can help patients who are inconvenient to visit the hospital to obtain real-time and correct diagnostic information during telemedicine, and seek different medical assistance according to the severity of symptoms; furthermore, immediately remind the medical staff when tracking the improvement or deterioration of pressure injuries, and make corresponding adjustments in treatment techniques and medication.

**Keywords.** Deep learning, YOLOv7, Pressure injuries identification, Telemedicine assistance system

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