Abstract
Noninvasive assessment of severity of liver fibrosis is crucial for understanding histology and making decisions on antiviral treatment for chronic HBV in view of the associated risks of biopsy. aimed to develop a computer-assisted assessment system for the evaluation of liver disease severity by using machine learning classifier based on physical-layer with serum markers. The retrospective data set, including 920 patients, was used to establish Decision Tree classifier (DTC), Random Forest Classifier (RFC), Logistic Regression Classifier (LRC), and Support Vector Classifier (SVC) for liver fibrosis severity assessment. Training and testing samples account for 50% of the data set, respectively. The best indicator combinations were selected in random combinations of 24 indicators including 67 108 760 group indicators by four different machine learning classifier. The resulting classifiers prospectively tested in 50% testing patients, and the sensitivity, septicity, overall accuracy, and receiver operating characteristics (ROC) were used to compare four classifiers to existed 19 models. Results show that the RFC-based classifier system, with 9 indicators, is feasible to assess severity for liver fibrosis with diagnostic accuracy (greater than 0.83) superior to existing 19 models. Additional studies based on a large data set with full serum markers and imaging information are necessary to enhance diagnostic accuracy and to expand clinical application.
LITERATURE SURVEY

In recent years, computer assisted quantitative technology has advanced. These approaches employ image texture analysis, a popular diagnostic tool for liver fibrosis. As a result, a number of researchers are concentrating their efforts on researching the image texture properties of distinct fibrosis stages. Texture analysis investigates the spatial variability of grey levels in an image by employing a sequence of mathematical equations to create a set of characteristics related to picture texture. The following are the limits of existing methodologies based on traditional machine learning: Only a few features are derived from the classification features, which are mostly dependent on subjective human experience. Image, video, speech, and audio processing have all benefited from deep convolution networks, although regular networks are mainly used for text and voice.

PROPOSED METHODOLOGY

As an artificial intelligence technology, deep learning has gained traction. It enables the creation of a model with many processing layers for the investigation of data representation at various levels of abstraction. After a chronic liver injury, liver fibrosis is a set of pathological and physiological processes that result in liver cell necrosis and degeneration, Extracellular matrix and collagen are finally deposited as a result of this process.

For early diagnosis and fast execution of appropriate treatment regimens, early identification and correct staging of fibrosis and cirrhosis are critical. Liver cancer has a 50% probability of arising from severe liver fibrosis. For detecting and staging liver fibrosis, a biopsy is commonly regarded as the gold standard. This approach, however, has several disadvantages, such as the likelihood of discomfort and sampling variability, as well as limited patient acceptance. Furthermore, whether a tissue diagnosis of liver fibrosis is required is still debatable. The degree of liver fibrosis can be measured using computer-assisted quantitative and deep learning methods.

IMPLEMENTATION
Figure 6.1.2 - Sign Up Page

Figure 6.1.3 - Details of Sign In Page
Figure 6.4: Random Forest Algorithm
Figures 6.1.5. Random Forest Algorithm With Details.

Figures 6.1.6. Graph Analysis
Machine Learning Assessment for Severity of Liver Fibrosis for Chronic HBV Based on Physcal Layer With Serum Markers

Random Forest Algorithm Graph
Model 1 vs. Item
Model2 vs. Item

Random Forest Algorithm Accuracy
Physical Layer 1: Item
Physical layer 2: Item

Figure 6.17: Find Accuracy
Dr. R. Mekala et al. (2022)

Figure 6.1.9. Graph Analysis

Figure 6.1.10. Machine Learning Assessment for Severity Of Liver Fibrosis
Machine Learning Assessment for Severity of Liver Fibrosis for Chronic HBV Based on Physical Layer With Serum Markers

<table>
<thead>
<tr>
<th>Image Analysis for Edge Detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Edge Detection System Module</td>
</tr>
<tr>
<td>Apply to Image for Edge Detection</td>
</tr>
</tbody>
</table>

Figure 6.1.31 - Severity Of Liver Fibrosis For This Image

<table>
<thead>
<tr>
<th>ID</th>
<th>Age</th>
<th>Sex</th>
<th>WBC</th>
<th>RBC</th>
<th>Hb (g/dL)</th>
<th>Platelet</th>
<th>ALT</th>
<th>AST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
<td>M</td>
<td>9.8</td>
<td>5.3</td>
<td>12.5</td>
<td>230</td>
<td>45</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>42</td>
<td>F</td>
<td>7.9</td>
<td>4.4</td>
<td>11.2</td>
<td>180</td>
<td>32</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>28</td>
<td>M</td>
<td>10.5</td>
<td>6.2</td>
<td>13.8</td>
<td>250</td>
<td>48</td>
<td>39</td>
</tr>
<tr>
<td>4</td>
<td>51</td>
<td>F</td>
<td>8.7</td>
<td>5.2</td>
<td>11.5</td>
<td>200</td>
<td>38</td>
<td>33</td>
</tr>
<tr>
<td>5</td>
<td>39</td>
<td>M</td>
<td>11.2</td>
<td>6.8</td>
<td>12.7</td>
<td>220</td>
<td>52</td>
<td>42</td>
</tr>
<tr>
<td>6</td>
<td>45</td>
<td>F</td>
<td>8.3</td>
<td>5.1</td>
<td>11.4</td>
<td>190</td>
<td>40</td>
<td>32</td>
</tr>
<tr>
<td>7</td>
<td>29</td>
<td>M</td>
<td>10.1</td>
<td>6.1</td>
<td>12.6</td>
<td>230</td>
<td>42</td>
<td>34</td>
</tr>
<tr>
<td>8</td>
<td>48</td>
<td>F</td>
<td>9.5</td>
<td>5.5</td>
<td>11.7</td>
<td>210</td>
<td>45</td>
<td>38</td>
</tr>
<tr>
<td>9</td>
<td>36</td>
<td>M</td>
<td>9.9</td>
<td>5.4</td>
<td>12.3</td>
<td>240</td>
<td>48</td>
<td>37</td>
</tr>
<tr>
<td>10</td>
<td>42</td>
<td>F</td>
<td>9.2</td>
<td>5.3</td>
<td>11.1</td>
<td>180</td>
<td>31</td>
<td>29</td>
</tr>
</tbody>
</table>

Figure 6.1.32 - Dataset for Liver Patients
CONCLUSION

A computer assisted technique was developed in this present application to estimate the degree of chronic HBV liver fibrosis. When compared to 19 current models and other machine learning approaches, RFC with 9 indications has the potential to better identifying the severity of liver fibrous is, particularly in the S2 and S3 stages. It is impossible to overestimate the value of high quality training data in the development of a classifier. Future research based on large data sets, such as serum manufacturer and physical layer imaging information, will be required to improve diagnosis accuracy and make practical application simpler.

References

Dr. R. Mekala et al. (2022)


