



Pathology Software for Diagnosis of Non-Alcoholic Fatty Liver Disease OTT ID # 1236

APPLICATIONS

Fully automated way to accurately and quickly estimate steatosis (fat) grade (SG) without the inherent variability of human assessment.

TARGET PROBLEMS

Although SG is a key factor in the diagnosis and staging of common liver diseases, pathologist’s manual assessment of SG is semiquantitative, discontinuous, and variable. Variation in the assessment of steatosis, necroinflammation, and fibrosis can lead to errors in diagnosis and staging of Non-Alcoholic Fatty Liver Disease (NAFLD), the most common liver disease in the United States.

KEY FEATURES

- **Automatic** – Supervised machine learning to automatically learn rules for classification of white regions
- **Multiple Applications** – Can be used in quantification of steatosis grade, rapid assessment of candidate donor livers in the transplant setting, and biopsy index database search
- **Faster** – Quicker classification of biopsies
- **More accurate** – Minimizes variability observed in diagnosed made by human pathologists

TECHNOLOGY

The invention is a supervised machine learning approach for automatically classifying “white-regions” of liver biopsies into 1 of 7 categories, thus providing an important decision support system for pathologists. White-region classification can be applied in multiple analyses performed on liver biopsies, with assessment of steatosis (fat) grade (SG) perhaps being the most direct. With the development of high-resolution scanners for liver (and other) biopsies, automated methods that process digitized images can now be used in the clinic. Currently the method can accurately classify more than 90% of the white regions, which include steatosis (fat) and the important anatomical landmarks such as bile ducts, hepatic arteries and portal veins.

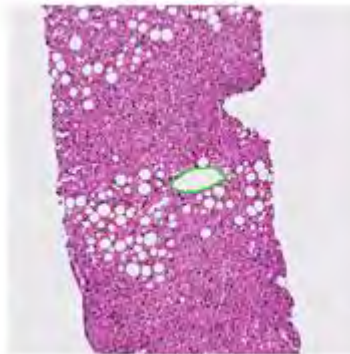


Figure 1: A central vein (shown outlined) identified by a multilayer perceptron neural network

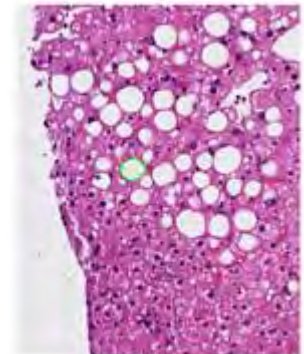


Figure 2: Macro-vesicular steatosis (shown outlined) identified by a multilayer perceptron neural network

INTELLECTUAL PROPERTY

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ABOUT THE INVENTOR(S)

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PUBLICATIONS

GAWRIEH, S., et al., “[Effects of interventions on intra- and interobserver agreement on interpretation of nonalcoholic fatty liver disease history](#),” Annals of Diagnostic Pathology, Volume 15, Issue 1, February 2011, Pages 19-24.

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