

## Automatic Gleason Grading of Prostate Cancer using Shearlet Transform and Multiple Kernel Learning

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**Summary:** An automated, noninvasive process to detect and classify prostate cancer cells

**Description:** The process is a method of classifying prostate tumors as cancerous or benign. It classifies the tumors according to the Gleason grading scale to determine the cancerous nature of the tumor. The process utilizes a shearlet transform, as well as three other features, and combines them via multiple kernel learning. The shearlet transform is used to represent the local structure of image textures. Multiple kernel learning is used to "fuse" color channel histograms, co-occurrence matrix features, statistics from discrete shearlet coefficients, and morphological features. While current methods of detecting prostate cancer can be inaccurate and often can cause more harm than good, this noninvasive method can detect cancer and classify tumors with remarkable accuracy.

### Advantages of this Invention:

- Demonstrated 100% accuracy in distinguishing between malignant and benign tissues
- Demonstrated 89% accuracy in classifying cells on Gleason grading scale
- Can be implemented with MRI to replace invasive detection methods (i.e. biopsy)

### Potential Areas of Application:

- Biomedical

**DU Log Number:** #244

**Intellectual Property Status:** Provisional application filed, #62/207,201

**Opportunity:** We are seeking an investor or strategic partner to license this invention.

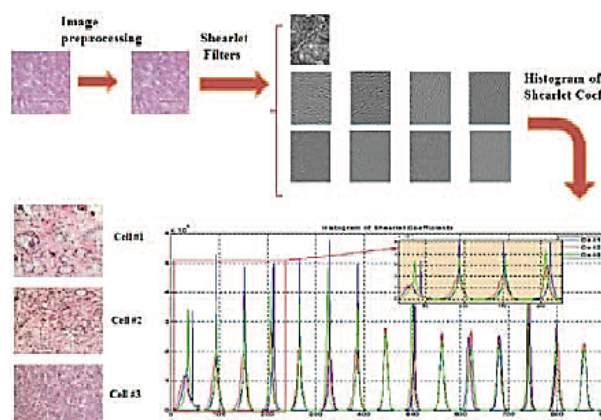


Fig. 1. Overview of our proposed cancer diagnosis and Gleason grading system using histogram of shearlet coefficients.

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