

## **Computer-Aided Diagnostic for Use in Multiparametric MRI for Prostate Cancer**

### **Summary**

Researchers at the National Institutes of Health Clinical Center (NIHCC) have developed computer-aided diagnostics (CAD) that may further improve the already superior capabilities of multiparametric magnetic resonance imaging (MRI) for detection and imaging of prostate cancer. This system produces an accurate probability map of potential cancerous lesions in multiparametric MRI images that is superior to other systems and may have multiple product applications.

### **NIH Reference Number**

E-183-2016

### **Product Type**

- Diagnostics
- Software

### **Keywords**

- Computer-aided Diagnostic
- Image Analysis System/Software
- National Institutes of Health Clinical Center
- NIHCC

### **Collaboration Opportunity**

This invention is available for licensing and co-development.

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### **Description of Technology**

Multiparametric MRI improves image detail and prostate cancer detection rates compared to standard MRI. Computer aided diagnostics (CAD) used in combination with multiparametric MRI images may further improve prostate cancer detection and visualization. The technology, developed by researchers at the National Institutes of Health Clinical Center (NIHCC), is an automated CAD system for use in processing and visualizing prostate lesions on multiparametric MRI images. The system uses specialized

algorithms (an ensemble of multiple random decision trees, Random Forest) that is trained against: 1) hand drawn contours, 2) recorded biopsy results, and 3) normal cases from randomly sampled patient images weighted for lesion size. This CAD system produces a more accurate probability map of potential cancerous lesions in multiparametric MRI images.

In addition, the CAD system may be used in several applications and settings including, but not limited to: 1) cloud-based prostate cancer screening, 2) use in under-resourced clinical settings with few or underexperienced radiologists, 3) integration into a work station or a picture archiving and communication system (PACS), 4) or serve as standalone software to be used on existing systems. This technology is currently available for licensing and co-development partnerships.

### **Potential Commercial Applications**

- Computer Assisted Diagnostics

### **Competitive Advantages**

- Faster image analysis, improved workflow
- More accurate diagnosis and treatment guidance
- Potential for cloud-based prostate cancer screening
- Use in under-resourced clinical settings
- Standalone software in existing systems
- Can be integrated into a work station or PACS

### **Inventor(s)**

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### **Development Stage**

- Basic (Target Identification)

### **Publications**

Nathan L, et al. Detection of prostate cancer in multiparametric MRI using random forest with instance weighting [[PMID: 28630883](#)]

### **Patent Status**

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/ 462,256, Filed 22 Feb 2016

### **Therapeutic Area**

- Cancer/Neoplasm

### **Updated**

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