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## **A Reusable Web-based CAT (CT) scan data management system for temporally characterizing Solid Nodules and Ground Glass Opacities in Lung Cancer patients**

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NYU and the EDRN Informatics team at JPL have been developing a general, reusable computed tomography (CT) scan web application and associated data management infrastructure for use by radiologists studying lung cancer to record observations regarding patient solid nodules and ground glass opacities as they evolve over time. We have developed a data model, and associated prototype web front end that allows a user to input metadata information (e.g., demographic information, ATS respiratory symptoms, occupational, family, medical, surgical and female-only history and underwent PFTs and multi-detector CT (MDCT) scanning) and store that information to a backend relational database (MySQL). The resultant web-based data system tracks the evolution of a nodule and integrates this information with clinical data to afford a researcher the ability to better define the follow-up interval in specific situations and identify earlier nodules with a greater malignant potential.

To construct the database, we are leveraging several emerging Java-based open source technologies, including: (1) Apache Tapestry for building a compact, easily maintainable web-based user interface to use for data input and for free-text and forms-based search, and (2) an object-relational persistence technology called Hibernate that affords us the ability to rapidly effect database design changes to our backend CT scan data model and collected data. Using these technologies, we are able to easily provide a means for persisting our collected data into MySQL, an open source relational database management system for further analysis by the radiologists and cancer researchers.

The CT scan web database system and associated data model are also being developed generically so that they can be deployed and reused at other EDRN sites that are recording information about CAT scans. The information recorded by the CT scan database has the potential to feed into other EDRN software activities, including the development of the EDRN Biomarker Atlas application for sharing patient image specimens (currently bronchoscopies, fluorescence, but with the potential for CT scans) identifying cancerous areas within the lung.

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