

**Project title: The Second CRC of Excellence of MOHW- China Medical University Hospital
Program title: Surgical Management of Pulmonary Ground Glass Opacity (GGO) Lesions Through the Integration of Low Dose Computed Tomography and Positron Emission Tomography in Lung Cancer**

**Surgical Management of Pulmonary Ground Glass Opacity (GGO) Lesions
Through the Integration of Low Dose Computed Tomography and Positron
Emission Tomography in Lung Cancer**

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The reliability of a computer aided diagnosis system highly depends on the delineation of the spatial extent of a pulmonary nodule in CT (computed Tomography) and PET (Positron Emission Tomography) and the parameters for measuring computerized features. In the previous results, a volume of interest (VOI) is manually defined by a physician to indicate a suspicious region. The spatial extent of a nodule is then delineated by computerized methods and described by computerized features. The definition of features is limited and only focus on the nodule. In this year, the vessels and bronchioles within VOI are detected and used to assist the definition of computerized feature. Besides, the robustness of computerized feature was achieved by two different concepts. First, scale invariant feature are defined to describe the heterogeneity of tumors based on the nonparametric statistics. Second, a standardized method is proposed to determine the discretization method and parameter for defining computerized features. According to the new developed delineation method and computerized features, the constructed computer aided diagnosis system shows a high reliability. The computerized features extracted from CT and PET images are validity to assess the surgical histopathology results of suspected lung cancer patients.