

An Integrated Approach to CTC Review and Report with Assistive CAD

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Introducing NeatCTC:

NeatCTC is a purpose built CTC reading system, designed from the ground up to provide maximum simplicity, efficiency, and flexibility in the reading and reporting of CT Colonography scans. It incorporates an advanced, automated **analysis engine** to assist the radiologist in the task of screening patients for colonic polyps and associated pathologies.

CAD Engine:

NeatCTC incorporates a multi-stage analysis engine, performing automatic colon segmentation, candidate surface extraction, and feature extraction and classification. In extensive tests using Mater and Walter Reed databases of CTC exams, acquired at standard and low dose radiation levels, the system has performed at sensitivities of **100%** for polyps larger than 10mm, **92%** for polyps in the range 5 to 10 mm, and **57%** for polyps smaller than 5mm, with an average of **3.38** false positives per dataset.

Show and hide tagged feature locations in all displayed views

Make accurate line and area measurements in both 2D orthogonal and 3D surface rendered views

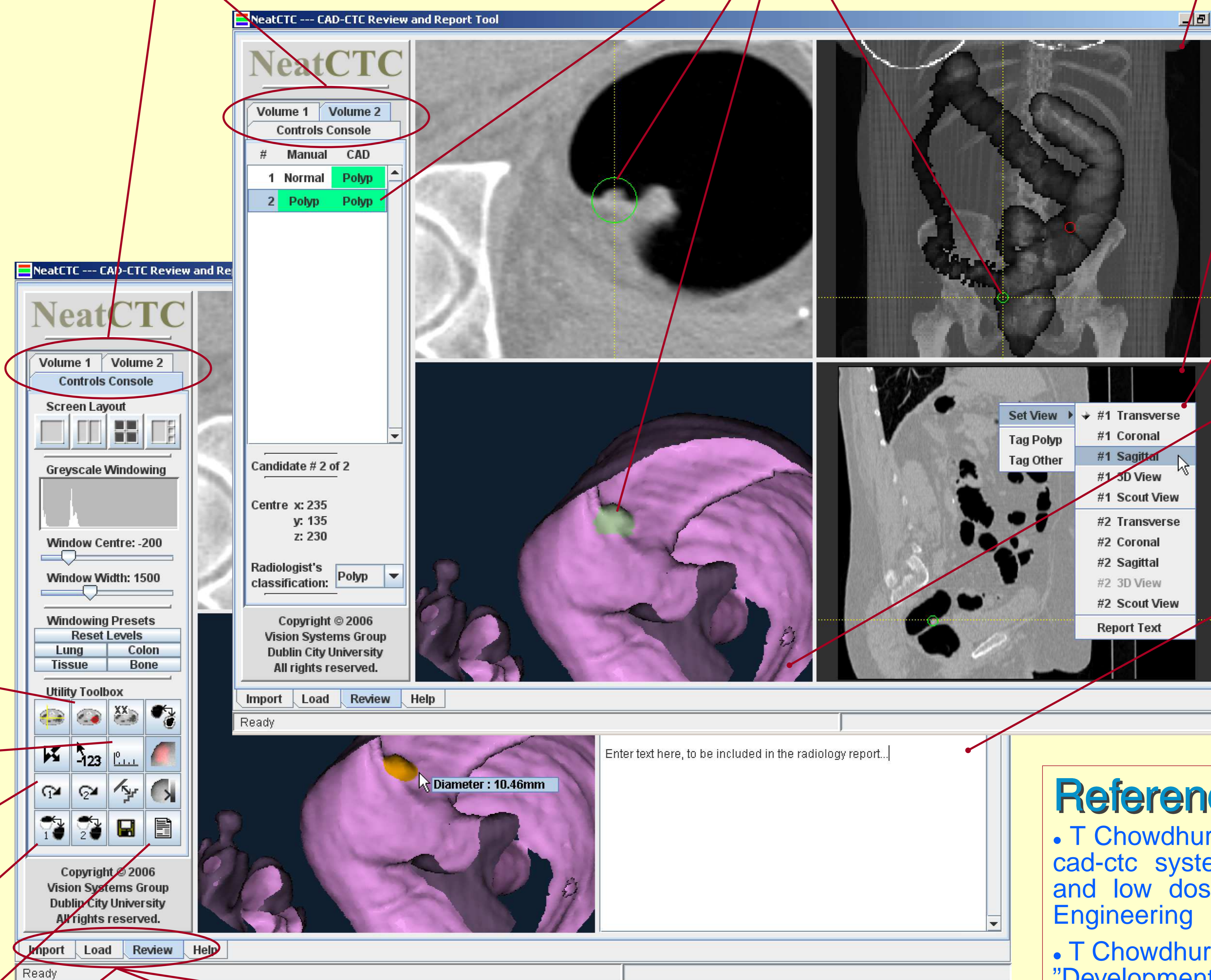
Roll-over either loaded data volume to align prone and supine series

Switch on-the-fly, between original and electronically cleansed data

Generate comprehensive radiology reports, in portable PDF format, at the push of a button

Gain easy access to system controls and tagged findings via the three *Review Pane* control tabs

Jump directly to any tagged feature, in all orthogonal views, by clicking either in the feature list, or on the marked feature in any view



MIP Scout view: See an overview of the loaded dataset as a coronal maximum intensity projection, with segmented colon displayed, and tagged features highlighted. Click on tag to jump to that feature in displayed orthogonal views.

2D Orthogonal views: Transverse, coronal, and sagittal views allow user to browse, zoom, and pan. One click centres other views at the selected location for easy navigation across multiple views. Tag features of interest from the popup menu.

Popup Menu: Place tags in 2D and 3D views, and switch between view types in each display window.

3D Surface Rendered views: Examine a region of interest in 3D, with tools to navigate, resize, and measure. Correlate with displayed 2D views, and place feature tags.

Report Text view: Enter free form text to be included on the summary page of the final radiology report, to further document tagged features included in the report.

Import: Automatically import DICOM data, with options to: anonymise the data, segment and analyse the colon and record the results, and apply electronic cleansing procedures.

Load: Review the list of imported studies and load up to two series for side by side review. View automatically generated CAD results documents, and previously generated final radiology reports.

Review: Perform fast and efficient reviewing and reporting of CTC exams using NeatCTC's well integrated reading functionality.

References:

- T Chowdhury, PF Whelan, O Ghita (2007), "A fully automatic cad-ctc system based on curvature analysis for standard and low dose ct data", IEEE Transactions on Biomedical Engineering
- T Chowdhury, PF Whelan, O Ghita, N Sezille, S Foley (2007), "Development of a synthetic phantom for the selection of optimal scanning parameters in cad-ct colonography", Medical Engineering & Physics 29(8):858-867
- A Miranda, T Chowdhury, O Ghita, PF Whelan (2006), "Shape filtering for false positive reduction at computed tomography colonography", MICCAI 2006, LECTURE NOTES IN COMPUTER SCIENCE 4191: 84-92 2006, Copenhagen, Denmark.

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