Curriculum Vitae and Bibliography
Cynthia H McCollough, PhD

Present Academic Rank and Position

Consultant - Department of Radiology, Mayo Clinic, Rochester, Minnesota 03/1994 - Present

Professor of Medical Physics - Mayo Clinic College of Medicine 10/2008 - Present

Professor of Biomedical Engineering - Mayo Clinic College of Medicine 12/2011 - Present

Career Scientist - Department of Radiology, Mayo Clinic, Rochester, Minnesota 01/2013 - Present

Education

Hope College - BS, Physics

University of Wisconsin, Madison - MS, Medical Physics

University of Wisconsin, Madison - PhD, Medical Physics

Certification

Board Certifications

American Board of Radiology (ABR)

Diagnostic Radiological Physics 1995 - Present

Research Interests

Director, CT Clinical Innovation Center Director, Opus CT Imaging Resources Dual-energy CT and material selective imaging Quantitative assessment of vascular plaque CT perfusion imaging Quantitative cardiac CT imaging X-ray computed tomography: Technology development, radiation dosimetry, technical performance evaluation, protocol optimization and reconstruction algorithms Quantitation of coronary artery calcium Low-dose CT screening exams (chest and colon)

Research Grants Awarded

Active Grants

Federal

Program Director / Principal Investigator	Trade-offs in human observer performance, image quality metrics, and patient dose. Funded by National Institute of Biomedical Imaging and Bioengineering. (R01 EB 17095)	09/2012 - 08/2017

Program Director / Principal Investigator	Critical resources to evaluate CT scan techniques and dose reduction approaches. Funded by National Institute of Biomedical Imaging and Bioengineering. (U01 EB 17185)	09/2013 - 08/2017
Program Director / Principal Investigator	Core B - Imaging Core: Improving stone disease treatment by accurate phenotyping and risk stratification. Funded by National Institute of Diabetes and Digestive and Kidney Diseases. (U54 DK 100227)	09/2013 - 06/2018
Program Director / Principal Investigator	Project 1: Non-invasive characterization of renal stones: Improving stone disease treatment by accurate phenotyping and risk stratification. Funded by National Institute of Diabetes and Digestive and Kidney Diseases. (U54 DK 100227)	09/2013 - 06/2018
Program Director / Principal Investigator	McCollough - Photon-Counting Spectral CT to Reduce Dose and Detect Early Vascular Disease: Photon-Counting Spectral CT to Reduce Dose and Detect Early Vascular Disease. Funded by National Institute of Biomedical Imaging and Bioengineering. (R01 EB 16966)	09/2013 - 08/2018
Co-Investigator	Motion Imaging Data Acquisition for Musculoskeletal Diagnosis. Funded by Minnesota Partnership for Biotechnology and Medical Genomics. (P004741901)	09/2014 - 06/2017
Co-Investigator	Lung Tissue Research Consortium (LTRC) - NHLBI-HR-16-06: Task Order 1 Lung Tissue Research Consortium (LTRC) - NHLBI-HR-16-06. Funded by National Heart, Lung, and Blood Institute	12/2015 - 01/2019

Mayo Clinic

Program Director / Principal Investigator	Phase Contrast Imaging using a Compact X-ray Light Source. Funded by ASU collaborative fund	07/2016 - 06/2019

Patents

Title	Patent Number	Date Filed	Date Issued
System and method for creating mixed image from dual-energy CT data Inventors: Lifeng Yu, Cynthia McCollough	US 7801265	11/2008	09/2010
System and method for quantitative imaging of chemical composition to decompose multiple materials Inventors: Liu X, Yu L, McCollogh CH	US 7885373	02/2009	02/2011
System and Method for Quantitative Imaging of Chemical Composition to Decompose More than Two Materials. Inventors: Liu X, Yu L, McCollough CH	US 8290232	02/2009	10/2012
System and method for Automatic Tube Potential Selection for Dose reduction in Medical Imaging Inventors: Yu L, McCollough CH, Fletcher JG, Li H	US 8699658	07/2010	04/2014
Method for creating images indicating material decomposition in dual energy, dual source helical computed tomography Inventors: Lifeng Yu; Cynthia McCollough	US 8705822	09/2009	04/2014
System and Method for Highly Attenuating Material Artifact Reduction in X-ray Computed Tomography. Inventors: CH McCollough	US 8280135	01/2010	10/2014
Apparatus, system, and method for non-convex prior image constrained compressed sensing Inventors: Ramirez Giraldo JC, Trzasko J, Leng S, Manduca A, McCollough CH	US 8897529	07/2011	11/2014
System and method for automatic tube potential selection for dose reduction in medical imaging Inventors: Lifeng Yu, Cynthia McCollough, JG Fletcher, Hua Li	US 8903037	02/2014	12/2014
System and method for denoising medical images adaptive to local noise Inventors: Yu L, Manduca A, Li Z, Fletcher JG, McCollough CH	US 9036771	02/2013	05/2015

Low Dose Coronary CT Imaging With Time-Adaptive Filtration Inventors: Ramirez Giraldo, JC; McCollough, CH; Leng, S	US 9111337	10/2013	08/2015
Method for controlling radiation dose and intravenous contrast dose in computed tomography imaging Inventors: Hough, David Yu, Lifeng Fletcher, Joel McCollough, Cynthia	US 9173617	10/2012	11/2015
System and Method for Improved Energy Series of Images Using Multi-Energy CT Inventors: Leng, S; McCollough, CH; Yu, L; Fletcher, JG; Mistretta, CA	US 9208585	11/2013	12/2015
Object identification in dual energy contrast-enhanced CT images Inventors: Dzyubak OP, Primak AN, McCollough CH	US 9532750	07/2008	01/2017

Bibliography

Peer-reviewed Articles

1. **McCollough CH**, Van Lysel MS, Peppler WW, Mistretta CA. A correlated noise reduction algorithm for dual-energy digital subtraction angiography. Med Phys. 1989 Nov-Dec; 16(6):873-80. PMID:2586373

2. **McCollough CH**, Miller WP, Van Lysel MS, Folts JD, Peppler WW, Albright DJ. Densitometric assessment of regional left ventricular systolic function during graded ischemia in the dog by use of dual-energy digital subtraction ventriculography. Am Heart J. 1993 Jun; 125(6):1667-75. PMID:8498309

3. **McCollough CH**, Cunningham IA, Felmlee, JP, et al. RSNA '93 meeting notes: technical exhibits. Radiology. 1994.(190):920-922.

4. **McCollough CH**, Morin RL. The technical design and performance of ultrafast computed tomography. Radiol Clin North Am. 1994 May; 32(3):521-36. PMID:8184027

5. * Zink FE, **McCollough CH**. The measurement of radiation dose profiles for electron-beam computed tomography using film dosimetry. Med Phys. 1994 Aug; 21(8):1287-91. PMID:7799873

6. **McCollough CH**, Zink FE, Morin RL. Radiation dosimetry for electron beam CT. Radiology. 1994 Sep; 192(3):637-43. PMID:8058927

7. Bielak LF, Kaufmann RB, Moll PP, **McCollough CH**, Schwartz RS, Sheedy PF 2nd. Small lesions in the heart identified at electron beam CT: calcification or noise? Radiology. 1994 Sep; 192(3):631-6. PMID:8058926

8. * Thomas PJ, **McCollough CH**, Ritman EL. An electron-beam CT approach for transvenous coronary arteriography. J Comput Assist Tomogr. 1995 May-Jun; 19(3):383-9. PMID:7790547

9. **McCollough CH**, Liu HH. Breast dose during electron-beam CT: measurement with film dosimetry. Radiology. 1995 Jul; 196(1):153-7. PMID:7784559

10. **McCollough CH**, Kaufmann RB, Cameron BM, Katz DJ, Sheedy PF 2nd, Peyser PA. Electron-beam CT: use of a calibration phantom to reduce variability in calcium quantitation. Radiology. 1995 Jul; 196(1):159-65. PMID:7784560

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14. **McCollough CH**, Kanal KM, Lannutti N, Ryan KJ. Experimental determination of section sensitivity profiles and image noise in electron beam computed tomography. Med Phys. 1999 Feb; 26(2):287-95. PMID:10076987

15. **McCollough CH**, Zink FE. Performance evaluation of a multi-slice CT system. Med Phys. 1999 Nov; 26(11):2223-30. PMID:10587202

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17. **McCollough CH**, Schueler BA. Calculation of effective dose. Med Phys. 2000 May; 27(5):828-37. PMID:10841384

18. * Kruger RL, **McCollough CH**, Zink FE. Measurement of half-value layer in x-ray CT: a comparison of two noninvasive techniques. Med Phys. 2000 Aug; 27(8):1915-9. PMID:10984237

19. **McCollough CH**, Bruesewitz MR, Daly TR, Zink FE. Motion artifacts in subsecond conventional CT and electron-beam CT: pictorial demonstration of temporal resolution. Radiographics. 2000 Nov-Dec; 20(6):1675-81. PMID:11112822

20. * Hara AK, Johnson CD, MacCarty RL, Welch TJ, **McCollough CH**, Harmsen WS. CT

colonography: single- versus multi-detector row imaging. Radiology. 2001 May; 219(2):461-5. PMID:11323473

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Bouxsein ML, Khosla S. Population-based study of age and sex differences in bone volumetric density, size, geometry, and structure at different skeletal sites. J Bone Miner Res. 2004 Dec; 19(12):1945-54. PMID:15537436

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PMID:18796678 PMCID:2657855 DOI:10.1148/radiol.2491071665

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