

## CURRICULUM VITAE

R. ALFREDO C. SIOCHI, PH.D.

### I. EDUCATIONAL AND PROFESSIONAL HISTORY

#### A. List of institutions attended, board certification, licensure

6/1981-3/1985	B. S. Ateneo de Manila University – Physics, Summa Cum Laude Quezon City Philippines
9/1985-2/1988	M.S. Virginia Tech University Blacksburg VA
9/1985-12/1990	Ph.D. Virginia Tech University Blacksburg VA
8/1993-3/1995	M.S. University of Cincinnati Cincinnati OH

#### Board certification

2005	American Board of Radiology in Radiological Physics
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#### B. Professional and Academic Positions

4/1985-6/1985	Instructor, Physics Department Ateneo de Manila University Quezon City, Philippines
9/1985-12/1990	Graduate Assistant, Physics Department Virginia Tech University Blacksburg VA
1/1991-5/1991	Visiting Assistant Professor, Physics Department Virginia Tech University Blacksburg VA
9/1991-5/1993	Visiting Assistant Professor, Physics Department Muskingum College New Concord OH
1/1994-3/1995	Graduate Student Assistant, University of Cincinnati Barrett Cancer Center Cincinnati OH
5/1995-8/2002	Medical Physicist, Siemens Medical Systems Oncology Care Systems Concord CA
8/2002-12/2004	Assistant Member, St. Jude Children's Research Hospital Memphis TN
1/2005-current	Assistant Professor, Department of Radiation Oncology, Iowa City IA

#### C. Honors and Awards

1997. U.S. Patent 5,663,999. Optimization of an intensity modulated field.  
1998. U.S. Patent 5,724,403. Virtual compensator.

- 2000. U.S. Patent 6,052,430. Dynamic sub-space intensity modulation.
- 2000. U.S. Patent 6,097,787. System and method for calculating scatter radiation.
- 2000. U.S. Patent 6,108,400. System and method for using precalculated strips in calculating scatter radiation.
- 2000. U.S. Patent 6,128,366. Dosimetry error reduction for optimized static intensity modulation.
- 2000. U.S. Patent 6,134,296. Microgradient intensity modulating multi-leaf collimator.
- 2000. U.S. Patent 6,142,925. Method and system for increasing resolution in a radiotherapy system
- 2000. U.S. Patent 6,167,114. System and method for calculating scatter radiation including a collimator thickness.
- 2001. U.S. Patent 6,240,161. Multi-leaf collimator constrained optimization of intensity modulated treatments.
- 2001. U.S. Patent 6,314,159. System and method for optimizing radiation treatment with an intensity modulating multi-leaf collimator.
- 2001. U.S. Patent 6,330,300. High definition intensity modulating radiation therapy system and method.
- 2002. U.S. Patent 6,349,129. System and method for defining radiation treatment intensity maps.
- 2002. U.S. Patent 6,353,655. System and method for calculating fluence contributions from a source plane.
- 2002. U.S. Patent 6,449,335. System and method for optimizing radiation treatment with an intensity modulating multi-leaf collimator.
- 2002. U.S. Patent 6,473,490. Intensity map reconstruction for radiation therapy with a modulating multi-leaf collimator.
- 2003. U.S. Patent 6,577,707. Edge extension of intensity map for radiation therapy with a modulating multi-leaf collimator.
- 2003. U.S. Patent 6,661,871. System and method for optimizing radiation treatment with an intensity modulating multi-leaf collimator by minimizing junctions.
- 2004. U.S. Patent 6,757,355. High-definition radiation treatment with an intensity modulating multi-leaf collimator.
- 2004. U.S. Patent 6,813,336. High definition conformal arc radiation therapy with a multi-leaf collimator.
- 2005. U.S. Patent 6,907,282. Intensity map resampling for multi-leaf collimator compatibility.
- 2005. U.S. Patent 6,968,035. System to present focused radiation treatment area.

### Honors

2000                      Siemens, Inventor of the Year

## **II. TEACHING**

### **A. Teaching assignments on semester by semester basis (least to most recent)**

Summer 1985                      Instructor, Introductory Physics

Fall 1985	Ateneo de Manila University Quezon City, Philippines Lab Instructor, Introductory Physics Virginia Tech Blacksburg VA
Spring 1986	Lab Instructor, Introductory Physics Virginia Tech Blacksburg VA
Fall 1986	Lab Instructor, Introductory Physics Virginia Tech Blacksburg VA
Spring 1987	Lab Instructor, Introductory Physics Virginia Tech Blacksburg VA
Winter 1991	Lab Instructor, Introductory Physics Virginia Tech Blacksburg VA
Fall 1991	Instructor, Fundamental Mathematics, Introductory Physics I, and Introduction to Computing Muskingum College New Concord OH
Spring 1992	Instructor, Fundamental Mathematics, Introductory Physics II, and Elementary Functions Muskingum College New Concord OH
Fall 1992	Instructor, Fundamentals Mathematics, Introductory Physics I, and Introduction to Experimental Physics I Muskingum College New Concord OH
Spring 1993	Instructor, Fundamental Mathematics, Introductory Physics II, and Applied Mathematics Muskingum College New Concord OH
Spring 2005	Assistant Professor, Medical Physics and Radiation Biology The University of Iowa Iowa City IA
Fall 2005	Assistant Professor, Medical Physics and Radiation Biology The University of Iowa Iowa City IA

**B. Students supervised  
(name, degree objective, outcome)**

Chris Muraski, Middle Tennessee State University, Murfreesboro TN  
James Sample, medical physics resident, The University of Iowa, Iowa City IA

**C. Other contributions to institutional programs**

**III. SCHOLARSHIP**

**A. Publications or creative works (least to most recent)**

1. Epp JM, Dillard JG, Siochi RAC, Zallen R, Cole ED, Sen S, Vaseashta A, Burton LC. Characteristics of Si-Implanted (211) versus (100) GaAs. In: Rehn LE, Green JE, Smidt FA, editors. Processing and Characterization of Materials Using Ion Beams, MRS Volume 128. Pittsburgh: Materials Research Society; 1989. p. 677.

2. Epp JM, Dillard JG, Siochi RAC, Zallen R, Sen S, Burton LC. Effects of ion bombardment on the chemical reactivity of GaAs(100): variation of bombarding ion mass. *Chemistry of Materials* 1990;2:173.
3. Siochi RA, Elson HR, Foster AE, Lamba MA. A self-collimating convolution backprojection algorithm for optimizing dose distributions of I-125 prostate implants. *Med. Phys.* 1997;24:241-249.
4. Siochi RAC. Requirements for manufacturer supplied data for Monte Carlo simulation: a BEAM perspective. In: Duggan JL, Morgan IL, editors. Proceedings of the Fifteenth International Conference on the Application of Accelerators in Research and Industry. Denton, TX; 1998. pp. 1060-1065.
5. Siochi RA. Minimizing static intensity modulation delivery time using an intensity solid paradigm. *Int. J. Radiat. Oncol. Biol. Phys.* 1999;43:671-680.
6. Siochi RAC. A fluence correction method for intensity modulation. In: Proceedings of the 38ieme Congres - Societe Francaise des Physiciens d'Hopital; 1999. pp. 5-15.
7. Siochi RAC. Optimized decomposition of virtual micro intensity maps. In: Schlegel W, Bortfeld T, editors. Proceedings of the 13th International Conference on the Use of Computers in Radiation Therapy. Heidelberg, Germany; 2000. pp. 300-302.
8. Siochi RAC. Simultaneous minimization of segments and junctions in virtual micro IMRT. In: Proceedings of the 22nd Annual International Conference of the IEEE. Vol 1; 2000. pp. 452-455.
9. Siochi RAC. Virtual micro-intensity modulated radiation therapy. *Med. Phys.* 2000;27:2480-2493.
10. Saw CB, Siochi RC, Ayyangar KM, Zhen W, Enke CA. Leaf sequencing techniques for MLC-based IMRT. *Med. Dosim.* 2001;26:199-204.
11. Siochi RAC. Problem directed optimization methods for radiation oncology physics. In: Radiation Oncology Physics 2001:FSRC Book of Abstracts, pp. 65-71; 2001.
12. Azcona JD, Siochi RA, Azinovic I. Quality assurance in IMRT: importance of the transmission through the jaws for an accurate calculation of absolute doses and relative distributions. *Med. Phys.* 2002;29:269-274.
13. Potter LD, Chang SX, Cullip TJ, Siochi AC. A quality and efficiency analysis of the IMFAST segmentation algorithm in head and neck "step & shoot" IMRT treatments. *Med. Phys.* 2002;29:275-283.
14. Siochi RA. Modifications to the IMFAST leaf sequencing optimization algorithm. *Med. Phys.* 2004;31:3267-3278.

#### **Non-Peer Reviewed Papers**

1. Siochi RAC, "Optical characterization of processed gallium arsenide," PhD Thesis, Virginia Tech Dept. of Physics, December 1990.

2. Siochi RAC, "A self-collimating convolution backprojection algorithm for brachytherapy optimization," MS Thesis, University of Cincinnati, February 19, 1995.

### **Abstracts**

1. Siochi RAC, "Leaf Sequencing Optimization for Static IMRT," *Med. Phys.* 1998;25, A200-A200
2. Siochi RAC, "Accuracy and Time Considerations in Intensity Modulation Treatment Planning," *Med. Phys.* 1999;26, 1086-1086
3. Siochi RAC, "Virtual Micro IMRT," *Med. Phys.* 1999; 26, 1096-1096
4. Siochi RAC, "Monitor Unit Scaling in IMRT," *Med. Phys.* 2001;28, 1283-1283
5. Siochi R. An improved IMFAST algorithm. *Med. Phys.* 2002;29:1334-1334
6. Siochi R. A variable depth recursion algorithm for leaf sequence optimization. *Med. Phys.* 2003;30:1404-1404.
7. Sontag M, Siochi R, Zhu Y, Samant S, Crawford B, Coffey D, Ying X, Merchant T. Dosimetric significance of MLC leaf width reduction in the treatment of infratentorial ependymoma. *Med. Phys.* 2003;30:1398-1398.
8. Siochi RC, Crawford B. Pixel value to dose conversion errors can reject acceptable IMRT plans. *International Journal Of Radiation Oncology Biology Physics* 2004;60:S625-S625.
9. Siochi RAC, "Simplifying IMRT plans through efficient segmentation," *Med. Phys.* 2005;32, 2085-2085

### **B. Areas of Research Interest and Current Projects**

1. Leaf Sequence optimization for Intensity Modulated Radiation Therapy
2. Virtual Micro Intensity Modulated Radiation Therapy
3. Fluence source models and fluence calculation algorithm development
4. Model based segmentation and 4D treatment planning

### **C. Published reviews of Scholarship**

### **D. Grants Received**

### **E. Invited Lectures, Conference Presentations, Visiting Professorships**

1. Siochi RAC, Zallen R. "Raman Scattering Comparison of Si-Implanted (211) and (100) GaAs," 1989 March Meeting of the American Physical Society, St. Louis, Missouri, March 1989.

2. Siochi RAC, Zallen R, Sen S, Burton LC. "The Structural Recovery and Electrical Activation of Si-Implanted GaAs as a Function of Anneal Temperature," 1992 March Meeting of the American Physical Society, Indianapolis, IN, March 1992.
3. Siochi RAC. "Estimating Phonon Dispersion Curves for Nanocrystalline Solids from Shifted and Broadened Raman Peaks," 1993 March Meeting of the American Physical Society, Seattle, Washington, March 1993.
4. Siochi RAC. "Fluence Error Reduction for Static IMRT by Segment Weighting," AAPM Annual meeting, San Antonio, Texas, August 9-13, 1998.
5. Siochi RAC. "A Fast Head Scatter Calculation Algorithm for Static IMRT," AAPM Annual meeting, San Antonio, Texas, August 9-13, 1998.
6. Siochi RAC, "Leaf Sequencing Optimization for Static IMRT," AAPM Annual meeting, San Antonio, Texas, August 9-13, 1998.
7. Siochi RAC, "Accuracy and Time Considerations in Intensity Modulation Treatment Planning," AAPM Annual meeting, Nashville, Tennessee, July 25-29, 1999.
8. Siochi RAC, "Virtual Micro IMRT," AAPM Annual meeting, Nashville, Tennessee, July 25-29, 1999.
9. Siochi RAC. "An Overview of Siemens' IMRT Approach," First Community Hospital IMRT Symposium and Workshop, September 15, 2000.
10. Siochi RAC. "The Future of Radiotherapy - An Historical Perspective," SATRO, May 2001.
11. Siochi RAC. "Controle de Qualidade - Radioterapia conformacional IMRT (Quality Control in conformational radiotherapy and IMRT)," Radioterapia de Última Geração, Sirio-Libanês Hospital, São Paulo, Brazil, June 28, 2001.
12. Siochi RAC. "IMRT - Conceitos Físicos (Physics concepts in IMRT)," Radioterapia de Última Geração, Sirio-Labanês Hospital, São Paulo, Brazil, June 28, 2001.
13. Siochi RAC, "Monitor Unit Scaling in IMRT," AAPM Annual meeting, Salt Lake City, Utah, July 22-26, 2001.
14. Siochi RAC. "IMRT with Siemens: Materials and Methods," Second Community Hospital IMRT Symposium and Workshop, September 29, 2001.
15. Siochi RAC. "The Effect of Using Integral Monitor Units in Intensity Modulation," VI Congresso Brasileiro de Física Médica, October 4, 2001.
16. Siochi RAC. "Terapia com Modulação de Intensidade de Feixe (therapy with field intensity modulation)," VI Congresso Brasileiro de Física Médica, October 4, 2001.
17. Siochi RAC. "Novas Tecnologias em Radioterapia (new technology in radiotherapy)," VI Congresso Brasileiro de Física Médica, October 4, 2001.
18. Siochi RAC. "Leaf Sequencing in IMRT," Fox Chase Cancer Center IMRT short course, April 2002.

19. Siochi RAC, Prosser S, Johnson S, Riker R. "Technical Aspects in IMRT," AFROC, April 8, 2002.
20. Siochi RAC. "An Improved IMFAST Algorithm," WE-C-517A-1, AAPM Annual Meeting, Montreal, Canada, July 14-18, 2002.
21. Siochi RAC. "Collimador Multi-Lamina: Uso e Controle de Qualidade," II Curso de Radioterapia de Ultima geracao, Hospital Sirio-Libanês, São Paulo, Brazil, August 16, 2002.
22. Siochi RAC. "Novas Perspectivas Tecnologicas," II Curso de Radioterapia de Ultima geracao, Hospital Sirio-Libanês, São Paulo, Brazil, August 16, 2002.
23. Siochi RAC. "IMRT Delivery Systems: Siemens Specific Issues," IMRT Practicum at Sea, University of Florida, January 12, 2003.
24. Siochi RAC. "A Multi-layer Complexity Model for Leaf Sequence Optimization," Optimization in Radiation Therapy Symposium, University of Florida, January 13, 2003.
25. Siochi RAC. "Posicionamento e Imobilizacao," III Curso de Radioterapia de Ultima geracao, Hospital Sirio-Libanês, São Paulo, Brazil, July 10, 2003.
26. Siochi RAC. "Implementação Clínica do IMRT," III Curso de Radioterapia de Ultima geracao, Hospital Sirio-Libanês, São Paulo, Brazil, July 10, 2003.
27. Siochi RAC. "Imagens: Anatômica e Funcional para 3DCRT e IMRT," III Curso de Radioterapia de Ultima geracao, Hospital Sirio-Libanês, São Paulo, Brazil, July 10, 2003.
28. Siochi RAC. "O Uso de Filmes em QA," III Curso de Radioterapia de Ultima geracao, Hospital Sirio-Libanês, São Paulo, Brazil, July 10, 2003.
29. Siochi RAC. "A Variable Depth Recursion Algorithm for Leaf Sequence Optimization," TU-D20B-1, 45th AAPM Annual Meeting, San Diego, California, August 10-14, 2003.
30. Siochi RAC, "Simplifying IMRT plans through efficient segmentation," invited presentation, TU-C-T-6C-3, 47th AAPM annual meeting, Seattle, WA, July 24-28, 2005
31. Siochi RAC, "Model Based Segmentation," Missouri River Valley AAPM chapter meeting, Nov. 5, 2005
32. Siochi RAC, "Model Based Segmentation for Treatment Planning," HCCC Forum, University of Iowa, Nov. 15, 2005

## **F. Pending Decisions**

## **IV. SERVICE**

### **A. Memberships in Professional Organizations**

*1993-current*

American Association of Physicists in Medicine

2004-current Children's Oncology Group

**B. Committees**

2006-current Equipment Management Work group (Representative for Radiation Oncology)