

May 18, 2017

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ACADEMIC APPOINTMENTS AND WORK EXPERIENCES

| | | |
|-----------------|--|--|
| 10/2016-present | <u>Medical Physicist / Assistant professor</u> | Division of Medical Physics & Engineering, Department of Radiation Oncology, The University of Texas Southwestern Medical Center, TX |
| 09/2014-09/2016 | <u>Physicist / Instructor</u> | Department of Radiation Oncology, Massachusetts General Hospital / Harvard Medical School, MA |
| 01/2013-08/2014 | <u>Postdoctoral Research Fellow</u> | Department of Radiation Oncology, Massachusetts General Hospital, MA |
| 10/2009-11/2012 | <u>Medical physicist/ Research professor</u> | Department of Radiation Oncology, Seoul National University Hospital, Seoul, Korea |

EDUCATION

Doctor of Philosophy, Interdisciplinary Program in Radiation Applied Life Science, August 2011
Seoul National University, Seoul, Korea

Dissertation: *A Study for Improvement of Accuracy and Efficiency in Respiratory Gated Radiotherapy: Development of Quasi-breath-hold Technique and On-line Motion Verification Technique*
Advisors: Prof. Sung-Joon Ye and Prof. Il Han Kim

Master of Science, Interdisciplinary Program in Radiation Applied Life Science, February 2007
Seoul National University, Seoul, Korea

Thesis: *Patient-Setup Aid with a Wireless Closed-Circuit Television (CCTV) System in Radiation Therapy*
Advisors: Prof. Soon Nyung Huh and Prof. Sung Whan Ha

Bachelor of Science, Nuclear Engineering, February 2005
Seoul National University, Seoul, Korea

Thesis: *Program Development of Orthogonal Two Directional Image Processing to Measure Bubble Size and Volume in Two-phase Flow*
Advisor: Prof. Goon Cherl Park

LANGUAGES

English (Professional working proficiency)

Korean (Native)

CERTIFICATES / LICENSES

05/2015 Diplomat of American Board of Radiology (ABR), Therapeutic Medical Physics

11/2016 Texas Medical Physicist License (Texas Medical Board, Therapeutic)

ACADEMIC ACHIEVEMENTS & AWARDS

08/2015 Featured article / Cover page Medical Physics (Volume 42, Issue 8)

09/2008 Best oral presentation award The 5th Korea-Japan Joint Meeting on Medical Physics, Jeju, Korea

ACADEMIC ACTIVITIES

03/2016- present Reviewer Australasian Physical & Engineering Sciences in Medicine

09/2014-present Reviewer Medical Physics

11/2014-present Reviewer International Journal of Computer Assisted Radiology and Surgery

06/2014-present Reviewer Journal of Radiation Research

07/2013-present Reviewer Journal of Medical Engineering

MEMBERSHIPS

05/2016-present Full member American Association of Physicists in Medicine (AAPM)

06/2012-04/2016 Corresponding member American Association of Physicists in Medicine (AAPM)

10/2009-12/2012 Member Korean Society of Medical Physics (KSMP)

PUBLICATIONS IN PEER-REVIEWED JOURNALS

- 1) J. Kim, Y.K. Park, G.C. Sharp, P. Busse, and B. Winey. "Water equivalent path length calculations using scatter-corrected head and neck CBCT images to evaluate patients for adaptive proton therapy," *Phys Med Biol* **62**(1), 59 (2016)
- 2) C. Kurz, F. Kamp, Y.K. Park, C. Zöllner, S. Rit, D. Hansen, M. Podesta, G.C. Sharp, M. Li, M. Reiner, J. Hofmaier, S. Nepl, C. Thieke, R. Nijhuis, U. Ganswindt, C. Belka, B.A. Winey, K. Parodi, and G. Landry, "Investigating deformable image registration and scatter correction for CBCT-based dose calculation in adaptive IMPT," *Med Phys* **43**(10), 5635-5646 (2016)
- 3) J. Bian, G.C. Sharp, Y.K. Park, J. Ouyang, T. Bortfeld, and G.E. Fakhri, "Investigation of Cone-beam CT Image Quality Trade-off for Image-Guided Radiation Therapy," *Phys Med Biol* **61**(9), 3317-3346 (2016)
- 4) M. Hoesl, S. Deepak, M. Moteabbed, G. Jassens, J. Orban, Y.K. Park, K. Parodi, H. Bentefour, and H.M. Lu, "Clinical commissioning of an in-vivo range verification system for prostate cancer treatment with anterior and anterior oblique proton beams," *Phys Med Biol* **61**(8), 3049-3062 (2016)
- 5) Y.K. Park, G.C. Sharp, J. Phillips, and B.A. Winey, "Proton dose calculation on scatter-corrected CBCT image: Feasibility study for adaptive proton therapy," *Med Phys* **42**(8), 4449-4459 (2015) [Featured article & cover page]
- 6) K.Y. Eom, E.K. Chie, K. Kim, J.H. Chang, T.R. Koo, J.I. Park, Y.G. Park, S.J. Ye, and S.W. Ha, "Pilot study on interfractional and intrafractional movements using surface infrared markers and EPID for patients with rectal cancer treated in the prone position," *Br J Radiol*, 20150144 (2015)
- 7) Y.K. Park and G.C. Sharp. "Gain Correction for an X-ray Imaging System With a Movable Flat Panel Detector and Intrinsic Localization Crosshair," *Technol Cancer Res Treat*, 1533034615576829 (2015)
- 8) H.J. Kim, S. Kim, Y.K. Park, J.I. Kim, J.M. Park, and S.J. Ye, "Multileaf collimator tongue-and-groove effect on depth and off-axis doses: A comparison of treatment planning data with measurements and Monte Carlo calculations," *Med Dosim* (2015)
- 9) T. Kim, S. Kim, Y.K. Park, K. Youn, P. Keall, and R. Lee, "Motion management within two respiratory-gating windows: feasibility study of dual quasi-breath-hold (DQBH) technique in gated medical procedures," *Phys Med Biol* **59**(21), 6583-6594 (2014)
- 10) Y.K. Park, S. Park, H.G. Wu, and S. Kim, "A new plan quality index for dose painting radiotherapy," *J Appl Clin Med Phys* **15**(4), 316-325 (2014)

- 11) H.J. Kim, A.R. Chang, Y.K. Park, and S. J. Ye, "Dosimetric effect of CT contrast agent in CyberKnife treatment plans," *Radiat Oncol* **8**, 244 (2013)
- 12) Y.K. Park, T. Son, H. Kim, J. Lee, W. Sung, I. H. Kim, K. Lee, Y. B. Bang, and S. J. Ye, "Development of real-time motion verification system using in-room optical images for respiratory-gated radiotherapy," *J Appl Clin Med Phys* **14**(5), 25-42 (2013).
- 13) J.I. Kim, J.B. Chung, Y.K. Park, J.Y. Song, S.K. Kim, S.H. Ahn, C.H. Choi, W.H. Choi, B. Cho, S.G. Ju, S.J. Kim, and S.J. Ye, "A multi-institutional study for tolerance and action levels of IMRT dose quality assurance measurements in Korea," *J Appl Clin Med Phys* **14**(2), 24-37 (2013).
- 14) J.W. Choi, C.M. Park, J.M. Goo, Y.K. Park, W. Sung, H.J. Lee, S.M. Lee, J.Y. Ko, and M.S. Shim, "C-Arm Cone-Beam CT-Guided Percutaneous Transthoracic Needle Biopsy of Small (≤ 20 mm) Lung Nodules: Diagnostic Accuracy and Complications in 161 Patients," *Am J Roentgenol* **199**(3), W322-30 (2012).
- 15) Y.K. Park, S. Kim, H. Kim, I.H. Kim, K. Lee, and S.J. Ye, "Quasi-breath-hold technique using personalized audio-visual biofeedback for respiratory motion management in radiotherapy," *Med Phys* **38**, 3114-3124 (2011).
- 16) H. Kim, Y.K. Park, I.H. Kim, K. Lee, and S.J. Ye, "Development of an optical-based image guidance system: technique detecting external markers behind a full facemask," *Med Phys* **38**, 3006-3012 (2011).
- 17) Y.K. Park, S.J. Ye, I.H. Kim, W.R. Wee, M.K. Kim, H.S. Han, K.J. Son, and U.J. Park, "Potential use of P-32 ophthalmic applicator: Monte Carlo simulations for design and dosimetry," *Med Phys* **35**, 1854-1858 (2008).

SELECTED CONFERENCE PRESENTATIONS

- 1) Y.K. Park, G.C. Sharp, and B.A. Winey, "Real-time diaphragm motion monitoring in rotational cone-beam projections using 4D digitally reconstructed radiography", ICCR 2016, London, UK (June 2016), Oral presentation
- 2) Y.K. Park, G.C. Sharp, S.J. Ye, and B.A. Winey, "Early Experience in Cone Beam Projection Image Streaming for Real Time Intrafractional Motion Monitoring Using a Conventional Linear Accelerator", ASTRO Annual Meeting, San Antonio, Texas (Oct. 2015), Oral presentation

3) *Y.K. Park*, G.C. Sharp, D. Gierga, S.J. Ye, and B.A. Winey, “Real-Time Intrafractional Motion Tracking During VMAT Delivery Using a Conventional Elekta CBCT System”, AAPM Annual Meeting, Anaheim, California (July 2015), Snap oral presentation

4) *Y.K. Park* and G.C. Sharp, “MAGIC: Multi-Acquisition Gain Image Correction for Mobile X-Ray Systems with Intrinsic Localization Crosshairs“, AAPM Annual Meeting, Austin, Texas (July 2014), Oral presentation

CLINICAL EXPERIENCES AND SYSTEMS WITH EXPERTISE

1) Acceptance test and commissioning (Role: physicist in charge)

05/2012 – 09/2012 SNUH, Seoul, Korea Linear accelerators (Varian Trilogy and TrueBeam)
TPS (Eclipse A10.0)

02/2010 – 04/2010 SNUH, Seoul, Korea Linear accelerators (Varian Clinac 2300iX and 21Ex)
TPS (Eclipse 8.0 and XiO 4.34)
Record & Verify system (ARIA 8.0)

2) Scanning system: Scanditronix/Wellhofer blue phantom & Omnipro accept software.

3) Linear accelerator operation/QA

- Varian Clinac 2300 iX, 21 Ex, 6 Ex, and Trilogy
- Siemens Mevatron
- Elekta Infinity
- Absolute output calibration: TG-51
- Mechanical QA: TG-142

4) Cyber Knife (Accuray) operation / QA

5) In-vivo dosimetry: MOSFET (Best), TLD (Harshaw), and Film (Gafchromic® EBT, Ashland)

6) External Beam TPS: Eclipse, XiO, Multi-Plan, and RayStation

7) Record & Verify system: ARIA and MOSAIQ

8) IMRT/VMAT QA

- 2D-Array Seven29 with Verisoft 3.1 (PTW)
- Gafchromic® EBT2, EBT3 (Ashland) Film dosimetry
- Octavius phantom (PTW), MapCheck with MaPhan (Sun Nuclear Corp.)

9) Motion management

- Respiratory gating treatment (Varian RPM and Philips Big Bore Brilliance 4D-CT)

10) Brachytherapy: QA and safety check for Cs-137 brachy sources

11) IORT: Daily QA for Mobetron (IntraOp)

RESEARCH SKILLS

1) Programming languages

| Language | Level of skill | Libraries / tool-kit with expertise |
|-----------|----------------|--|
| C++ | Advanced | QT4, Visual C++, STL, OpenCV, ITK, VTK, CMake, RTK, DCMTK, plastimatch |
| Excel VBA | Advanced | |
| Matlab | Advanced | |
| Python | Beginner | |

2) Development experiences (as a main or sole programmer)

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|-----------|---|--|
| 2014-2016 | Intra-fractional motion monitoring software using kV cone-beam projection streaming (Kilovoltage Projection Streaming based Tracking Application, KiPSTA) | C++, QT4, ITK, VTK, DCMTK, plastimatch |
| 2015 | Easy gamma 3D: GUI-based 3D gamma evaluation tool with batch-mode capability | C++, QT4, plastimatch |
| 2013-2014 | GUI-based CBCT scatter correction / reconstruction software | C++, QT4, RTK, plastimatch |
| 2013 | Software interface for flat panel detector and DIPS system in MGH proton center (<u>in clinical use</u>) | C++, QT4 |
| 2010-2011 | Stereo camera-based real-time marker tracking and audiovisual biofeedback software | VC++, OpenCV, VTK |
| 2009 | Smart sheet for daily / monthly / annual QA of linear accelerator (<u>in clinical use</u>) | Excel VBA |
| 2009 | Film (Gafchromic EBT) calibration/conversion software for IMRT/VMAT QA (<u>in clinical use</u>) | VC++ |
| 2008 | Patient-specific audio-coaching software for gated radiation therapy (<u>in clinical use</u>) | VC++ |

2008-2009 Beam-data management / MU calculation software VC++, Excel VBA
(in clinical use)

3) Experiences in Monte Carlo simulation

- MCNP4 for Brachytherapy source simulation
- BEAMnrc for medical linear accerator simulation

4) Hardware design / development

- Infrared stereo-camera system
- Computer-controlled 2D motion phantom
- IMRT QA phantom (in clinical use)