

## BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME <b>Seong K. Mun</b>	POSITION TITLE <b>Professor, Physics</b> <b>Director, Arlington Innovation Center for Health Research, Virginia Tech</b>		
eRA COMMONS USER NAME (credential, e.g., agency login) <b>seongmun</b>			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
University of California, Riverside, CA	BA	03/69	Physics
State University of New York, Albany, NY	PhD	06/79	Physics
University of Colorado Medical Center, CO	NIH PostDoc	07/81	Medical Physics

### A. Positions and Honors

#### Positions and Employment

- 2008-            Director of Arlington Innovation Center for Health Research and Professor of Physics, Virginia Polytechnic Institute and State University, National Capital Region, Arlington, VA  
Current focus: Artificial Intelligence, Digital Transformation for productivity improvement and Making Artificial Intelligence Meaningful for Healthcare, Bioinformatics for cancer
  
- 2021-            Senior Imaging Scientist, Apollo Cancer Project, National Cancer Institute (NCI)- Contractor (40% FTE) – Project involving Imaging components of Department of Defense, Department of Veterans Affairs and the National Cancer Institute
  
- 2017-            Adjunct Professor, Georgetown University, School of Nursing and Health Systems  
Teaching a graduate level course on "US Healthcare Delivery System"
  
- 2011-2020      President and CEO, Open-Source Electronic Health Record Agent (OSEHRA), a not-for-profit agency established by the Department of Veterans Affairs to bring rapid innovation to health information technology and electronic health records
  
- 2013-2016      Adjunct Professor of Medical Informatics, the Catholic University of Korea
  
- 2013-2017      Executive Secretary of Advisory Board to the President of POSTECH University, Korea
  
- 2008-            Adjunct Professor of Radiology, Georgetown University Medical Center, Washington, DC
  
- 2004-2008      Associate Vice President for Special Programs, Georgetown University Medical Center  
Office of Federal Relations, Georgetown University, Washington, DC
  
- 1998-2004      Director, Special Initiatives (Federal Relations), Georgetown University Medical Center
  
- 1984-2008      Director, Imaging Science and Information Systems (ISIS) Center, Professor of Radiology, Georgetown University Medical Center, Washington, DC  
The ISIS Center had a staff of 60 people working in radiology digital transformation, telemedicine, robotics, global disease surveillance, combat casualty care, chronic illness

management, electronic health record, computer aided diagnosis and imaging artificial intelligence.

- 1983-1984 Assistant Professor, Managing NMR Physicist, Columbia University–Philips Medical Systems 1.5T MRI R and D Project; Neurological Institute of New York, Columbia Presbyterian Hospital, New York, NY
- 1982-1983 Director, Division of Imaging Physics, Assistant Professor of Radiology, Department of Radiology, Georgetown University Hospital, Washington, DC
- 1981-1983 Assistant Professor of Radiation Medicine, Georgetown University Medical Center
- 1979-1981 Summer Research Fellow – MRI Lab of Dr. Paul C Lauterbur (Nobel Laureate 2003), SUNY, Stony Brook, NY

### **Other Experience and Professional Memberships**

- Founder: International Conference: Image Management and Communication System (1989-2004)  
Meeting held in Washington, DC, Kyoto Japan, Seoul, Korea, Honolulu, HI
- Organizer/  
Chair National Forum: Telemedicine On-Line Today, March 1995-96; Washington, DC  
Pacific Medical Technology Symposium, August 1998, Honolulu, HI  
Network Security Workshop, April, 2006, Washington, DC  
Distributed Care and Home Care: IEEE-EMBS Special Symposium, April 2006  
Multicenter Information Management Symposium (2006-2007)  
National Forum in the Future of Defense Health Information Technology – DC- 2008  
Organizing Committee, Traumatic Brain Injury Imaging Workshop, 2008, St. Louis.  
Workshop on Patient Centered Medical Home, Alexandria, VA – 2010  
Workshop on Neuro-Performance and Imaging, Alexandria, VA, 2010  
Co-Chair: Workshop- Open Source Software and Military Health Service (2011)  
Co-chair, IEEE-AMA Medical Technology Symposium on Health Informatics (2010)  
Chair: Open Source OSEHRA Summit (2012-2019)
- President: Board of Scientific Counselors, National Library of Medicine, NIH, 1992-1996
- Fellow: American Institute of Medical and Biological Engineering (AIMBE)
- Member: Editorial Board of Int. Journal of Computer-Assisted Radiology and Surgery  
Editorial Board of Journal of Telemedicine and e-Health  
Editorial Board of Frontiers in Cancer Research
- Guest Editor MDPI Special Issue; Artificial Intelligence and Radiation Oncology -2023
- Guest Editor IEEE Transactions on Information Technology in Biomedicine (TITB) -2007
- Guest Editor Journal of Military Medicine Supplement of Health Information Tech -2008
- Head: Consulting Team for Digital Conversion of Coal Workers' Health Surveillance Program, National Institute for Occupational Health and Safety, Center for Disease Control and Prevention (2009-2011)
- Sr. Member Consulting for the Developing Research Management Enterprise Systems (RMES) for US Army Medical Research and Material Command, Ft. Detrick, MD (2009-2011)
- Member: Member of the Board for Particle Therapy Institute of Cure Foundation (2010-2013)
- Member: Advisory Board, Department of Electrical Engineering, Catholic University of America
- Member: Treasure and Member of the Ex. Board of American Telemedicine Association (2007 -2011)
- Member: Advisory Board for CiTE Program, POSTECH University, Korea (2013-2017)

**Patent:** Internet-based Diabetes Management System, MyCareTeam (Awarded in 2010)

### **Awards**

1998 Global IT Infrastructure Award on Deployable Radiology for US Troops in Bosnia, 1998  
2007 General Maxwell Thurman Award for Excellence in Telemedicine & Advanced Medical  
Technology USAMRMC, US Army  
2018 The FedHealthIT100 Leadership Award

### **Military Service**

1973-76 Army of Republic of Korea

### **Book Published:**

- Kim, Youngho and Mun, Seong K, "**Opendatopia**" Published by Book Ocean, Seoul, Korea, July 28, 2017
- Co-editor with Sonja Dietrich, PhD, "**Artificial Intelligence and Radiation Oncology**", Publisher; World Scientific, Publication Date – January 2023

### **Peer-reviewed Publications-**

- Mun, SK, Lo, SB, Wong, K, Koh, D-M, Prior, F, Emerging Value-Based Radiology in the Era of Artificial Intelligence, Medical Research Archives, [online] 11(6). <https://doi.org/10.18103/mra.v11i6.3915>, (2023)
- Dong, Y, Wang Y., Mun,S, Blockchain-enabled next generation access control. In: Prieto J. PA, Leitão P., Pinto A., editor. BLOCKCHAIN 2021; 2021 September 03. Lecture Notes in Networks and Systems: Springer, Cham; 2022. (BLOCKCHAIN Best Paper Application Award)
- Mun, S. K., & Koh, D. M. (2022). Special Issue: "Machine Learning for Computer-Aided Diagnosis in Biomedical Imaging". *Diagnostics (Basel, Switzerland)*, 12(6), 1331. <https://doi.org/10.3390/diagnostics12061331>
- Koh, D-M,,,,, Mun, SK,,,,, Prior F., Artificial Intelligence and machine learning in Cancer Imaging *Commun Med* 2, 133 (2022). <https://doi.org/10.1038/s43856-022-00199-0>
- Dong, Y, Mun, SK, and Wang Y; Blockchain-Enabled Next Generation Access Control;\_J. Prieto et al. (Eds.): BLOCKCHAIN 2021, LNNS 320, pp. 319–328, 2022. [https://doi.org/10.1007/978-3-030-86162-9\\_32](https://doi.org/10.1007/978-3-030-86162-9_32)
- Michael Rutherford, Seong Mun, Betty Levine, William Bennett, Kirk Smith, Phillip Farmer, Jeremy Jarosz, Ulrike Wagner, John Freymann, Geri Blake, Lawrence Tarbox, Keyvan Farahani, and Fred Prior, "A DICOM dataset for evaluation of medical image de-identification" Scientific Data, *Sci Data* 8, 183 (2021). <https://doi.org/10.1038/s41597-021-00967-y>
- Mun, SK, Wong, Lo, S-C, Li, Y and Bayarsaikhan, S, "Artificial Intelligence for the Future Radiology Diagnostic Service", Front. Mol. Biosci., 28 January 2021 | <https://doi.org/10.3389/fmolb.2020.614258>
- K.H. Wong, Bayarsaikhan S, B. Levine, S. and SK Mun. "Prototype of a Military Medic Smartphone Medical Graphical User Interface for Use By Medics in Deployed Environments", Military Medicine, Vol 185, Supp. 1, 2020, pp536-543
- SCB Lo, M.T. Freedman, S.K. Mun, HP Chan, Geared Rotationally Identical and Invariant Convolutional Neural Network Systems, *arXiv preprint arXiv:1808.01280*, August 2018

- SC.B. Lo, M.T. Freedman, S.K. Mun," Transformationally Identical and Invariant Convolutional Neural Networks by Combining Symmetric Operations or Input Vectors, *arXiv preprint arXiv:1807.11156*, July 2018
- Mun, SK, Park, JW, Dritschilo A, Collins SP, Suy S, Choi IY, Rho MJ. "The Prostate Clinical Outlook (PCO) Classifier Application for Predicting Biochemical Recurrences in Patients Treated by Stereotactic Body Radiation Therapy (SBRT)", *Appl. Sci.* 2018, 8, 1620; doi:10.3390/app8091620
- Park JW, Rho MJ, Dritschilo A, Choi IY, Mun SK," Prostate Clinical Outlook Visualization System for Patients and Clinicians Considering Cyberknife Treatment – A Personalized Approach; *Applied Science*, March, 2018, 8:471
- Lo SB, Freedman MT, Gillis LB, White CS, Mun SK," Journal Club: "Computer Assisted Detection of Lung Nodules on CT with a Computerized Pulmonary Vessel Suppressed Function," *AJR Am J. Roentgenology*, 2018 Mar; 210(3) 480-488
- Robinson, James, Turner, J, Tian, Yan, Neustadtl, Al and, Mun, Seong, Levin, Betty: "The Relationship between Emotional and Esteem Social Support Messages and Health Communication", *Health Communication*. 2017 Nov 28:1-7
- Alpay Özcan · Barş Türkbey · Peter L Choyke · Oguz Akin · Ömer Aras · Seong K Mun, Interactive Feature Space Explorer© for Multi-Modal Magnetic Resonance Imaging, *Magnetic Resonance Imaging* 04/2015; 33(6). DOI:10.1016/j.mri.2015.03.007
- Mi Jung Rho, Si Ra Kim, Hun-Sung Kim, Jae-Hyoung Cho, Kun-Ho Yoon, Seong K. Mun, and InYoung Choi; Exploring the Relationship Among User Satisfaction Compliance, and Clinical Outcomes of Telemedicine Services for Glucose Control, *J. Telemedicine and e-health*, Vol 20, 1-9, 2014
- Inyoung Choi, Tae-min Kim, Myung Shin Kim, Seong K. Mun, Yeun-Jun Chung," Perspective on Clinical Informatics; Integrating large-Scale Clinical Genomics, and Health Information for Clinical Care", *Genomics Inform.* 2013 Dec;11(4):186-190
- Alpay Özcan<sup>1,\*</sup>, Kenneth H. Wong<sup>1</sup>, Linda Larson-Prior<sup>2</sup>, Zang-Hee Cho<sup>3</sup> and Seong K. Mun, Background and Mathematical Analysis of Diffusion MRI Methods, *International J of Imaging Systems and Technology* Vol 22, 44-52, 2012
- Turner, J, Robinson, James, Tian, Yan, Neustadtl, Aland, Russell, Marie, Mun, Seong, Can Messages make a Difference? Association between e-mail messages and health outcomes in diabetes patients, ' *Journal of Human Communication* Vol39, 252-268, 2013
- Marshall R, Doperak M, Milner M, Motsinger C, Newton T, Padden M, Pastoor S, Hughes CL, LeFurgy J, and Mun SK.; Medical Home: An Emerging Primary Care Model and the Military Health System, *Journal of Military Medicine*. Vol 176, Number 11, Nov 2012, pp1253-1259(7)
- Green E, Wendland J, Carver MC, Hughes CL, and Mun SK.; Lessons Learned from Implementing the Patient-Centered Medical Home, *Health Expectations*; *International Journal of Telemedicine*, <http://www.hindawi.com/journals/ijta/2012/103685/>
- Leventhal T, Taliafero J, Wong KH, Hughes CL, and Mun SK. The Patient Centered Medical Home and Health Information Technology, *Journal of Telemedicine and e-Health*. March 2012 18(2); 145-149
- Hughes CL, Marshall R, Murphy E, and Mun SK." Technologies in the Patient Centered Medical Home: Examining the Model from an Enterprise Perspective, *Journal of Telemedicine and e-Health* , 2011
- Benzinger, T, Brody, D, Cardin S, Curley, K, Mintun M., Mun, SK, Wong K, Wrathall.J, Blast-Related Brain Injury: Imaging for Clinical and Research Applications, *JOURNAL OF NEUROTRAUMA* 26:2127–2144 (December 2009)
- Weng, C, Levine, B., Min, SK, Software Architecture and Engineering for Patient Records; Current and Future, *Military Medicine*, Vol 174,27-34 Supplement, May 2009
- Mun, SK, and Prior, F, Image Management in Enterprise Environment in Healthcare, *IEEE Transactions on Information Technology in Biomedicine (TITB)* Vol. 11, 1-5 (2007)
- Cleary, K, Kinsella A, Mun, SK OR2020 Workshop Report: Operating Room Of the Future: *International Congress Series*, Vol 1281, pp 832-838, May 2005
- Mun, S.K., Cleary K,: The Operating room of the future: review of OR 2020 Workshop, *Proceedings of SPIE*, April 2005

- “Managing Diabetes Using MyCareTeam Internet Application”, BA Levine, S Clement, MJT Hu, A Alaoui, SK Mun, On the Cutting Edge, Spring 2001, Vol 22, No. 2, pp. 9-11.
- “Impact of MyCareTeam for Poorly Controlled DM”, KE Smith, B Levine, SC Clement, MJ Hu, A Alaoui, SK Mun. Diabetes Technology and Therapeutics, 2004, Vol 6. 828-835.
- “Doctor and Patient Interactions During Telemedicine: Clashes of Perceptions and Reality”, JW Turner, JD Robinson, A Alaoui, J Winchester, A Neustadtl, BA Levine, J Collmann, SK Mun, In Understanding Health Communication Technologies, P. Whitten and D. Cook, (Eds.) Jossey-Bass, John Wiley & Sons, Inc., 2004, pp 118-126
- “Understanding the communicative context created through telemedicine interactions” JW Turner, JD Robinson, A Alaoui, J Winchester, A Neustadtl, B Levine, J Collmann, SK Mun, In Health Communication (Gesundheitskommunikation), A. Schorr (Ed.) Verlag, Gottingen, Germany, Hogrefe & Huber Publishers.
- Cleary, K, Clifford, MA, Stolanovich, D,.. Mun, SK, Watson V., " Technology improvements for image-guided and minimally invasive spine procedures, IEE Trans. On Info Technology in Biomedicine, 6(4):249-61, 2002, DOI:10.1109/TITB 2002 806089
- J. Zeng, J. Bauer, W. Zhang, I. Sesterhenn, R. Connelly, J. Lynch, J. Moul and S.K. Mun, Prostate biopsy protocols: 3-D visualization-based evaluation and clinical correlation, Computer Assisted Surgery, 6:14-21, June 2001.
- Mun, SK, and Turner, J, Telemedicine: Emerging e-medicine, Ann Rev Biomed Eng. 1999, 01:789-610,
- Mun SK, Levine BA, Cleary K, and Dai H, “Deployable Teleradiology and Telemedicine for the US Military,” Computer Methods and Programs in Biomedicine, Elsevier Science Ireland LTD., 57 (1998) 21-27
- Hayes WS, Tohme WG, Komo, D, Mun SK,..... Pahira “A Telemedicine Consultative Service for the Evaluation of Patients With Urolithiasis,” Urology, 1998 Jan; 51(1): 39-43
- Tohme, W.G., Winchester, J.F., Collmann, J. et al, “Remote Management of Hemodialysis Patients: Design and Implementation of a Telemedicine Network,” Journal of Minimally Invasive Therapy and Allied Technologies, Vol. 6, No. 5-6, pp. 421-428, 1997.
- Lo, S-C.B., Lou, S.L., Lin, J.S., Freedman, M., Chien, M.V., and Mun, S.K., “Artificial Convolution Neural Network Techniques and Applications to Lung Nodule Detection,” IEEE Trans. on Med. Imaging, Vol. 14, No. 4, pp. 711-718, 1995.
- Lin, J.S., Hasegawa, A., Freedman, M., Mun, S.K., “Differentiation between nodules and end-on vessels using a convolutional neural network architecture,” J Digital Imaging, Vol. 8, pp. 132-141
- Freedman, M., Steller, D., and Mun, S.K., "Digital Radiography of the Musculoskeletal System: The Optimal Image," J Digital Imaging, Vol. 8, pp. 37-42, 1995.
- Mun, S.K., Elsayed A., Tohme W.G., and Wu Y.C., "Teleradiology/Telepathology: Requirements and Implementation," J. of Medical Systems, Vol.19, No. 2, pp.153-164, April 1995.
- Lo, S-C.B., Chan, H.P., Lin, J.S., Li, H., Freedman, M., and Mun, S.K., "Artificial Convolutional Neural Network for Medical Image Pattern Recognition," Neural Networks, 1995.
- Garra B., Krasner SH, Horii,.... Mun, S.K., " Improving the Distinction between Benign and Malignant Breast Lesions: The Value of Sonographic Texture Analysis, Ultrasound Imaging 14(4): 267:85, 1993
- Mun, S.K. and Goeringer, F., "Image Management and Communications System for Radiology Service," Medical Progress through Technology, Vol. 18, pp. 165-179, 1992.
- Lo, S-C.B., Lou, S.L., and Mun, S.K., "Projection Domain Compression of Missing Angles for Fan-Beam CT Reconstruction," Computerized Medical Imaging and Graphics, Vol. 16, pp. 259-269, 1992.
- Mun, S.K., Horii, S.C., and Benson, H., " Picture Archiving and Communication in Radiology: An American Perspective," J. of Digital Imaging, Vol. 4, 1991..
- Lo, S-C.B., Krasner, B., and Mun, S.K., "Noise Impact on Error - Free Image Compression," IEEE Transactions on Medical Imaging, Vol. 9, No.2, pp. 202-206, 1990.
- Hilal, S.K., Maudsley, A.A., Mun, S.K., et al., "In Vivo NMR Imaging of Sodium - 23 in the Human Head," Assist. Tomo., Vol. 9, pp.1-7, 1985.
- Mun, S.K., "Operating Magnetic Field for NMR Imaging," Radiographics, Vol. 4, pp. 44-48, 1984.

- Mun, S.K., Mallick, M., Mishra, M., Chang, J.C., and Das, T.P., "Theory of Proton Hyperfine Interaction in Fe (III) and Mn (II) Hemoglobin Derivatives," J. Am. Chem. Soc., Vol.103, pp. 5024-5031, 1981.
- Mun, S.K., Chang, J.C., and Das, T.P., "Theory of Hyperfine Fields at Fe-57 and N-14 sites in Metmyoglobin and Related Compounds," J. Am. Chem. Soc., Vol. 101, pp. 5562-5568, 1979.
- Mun, S.K., Chang, J.C., and Das, T.P., "Origin of Observed Changes in N-14 Hyperfine Interaction accompanying R to T Transition in Nitrosyl-hemoglobin," Proc. Natl. Acad. Sci, USA, Vol. 76, pp. 4842-4846, 1979.

## **B. Funded Major Research Projects – Total Aggregate Amount: \$74,184,547**

- **Clinical Trial Study (for FDA) of a Newly Developed Chest x-ray AI software**  
Co-PI with Shih-Chung B. Lo, PhD  
Riverain Technology: Total Amount: \$250,000  
May 1, 2021 to Nov 1, 2021
- **Apollo Cancer Imaging Research (NCI) Research** Support Contract Through Frederick National Lab for Cancer Research Operated by Leidos Corporation for National Cancer Institute  
40% -50% of my time as P.I.  
December 2020 –Jan 2024 (including 2 option years; 2022 and 2023  
Total ceiling amount including 2 option years: \$507,445
- MedicaSoft LLC, PI – Seong K. Mun,  
**“Localization of Open-Source VistA Electronic Health Record**  
MedicaSoft LLC, PI – Seong K. Mun,  
Period of Performance: 6/1/2020 – 11/30/2020.  
Total Amount: \$46,410.00.
- Tai Hao Corporation:  
**FDA Evaluation of TaiHao Breast Ultrasound Diagnosis Artificial Intelligence Software**  
Role: Co-PI  
Total Amount: \$168,194 (2020)
- OSEHRA – Veterans Affairs (2012-2019) \$24 million, approximately \$4.5 - \$3million per year  
**Management of Open-Source Electronic Health Record Agent**  
Role: P.I. Serving as President and CEO of OSEHRA Inc., Not-for-Profit
- Ruggedized Medic Smart Phone (2012- 2018): \$1,357,000  
**Development of Rugged Smartphone for Medics in the Battlefield**  
US Army Medical Research and Material Command  
Role: Co-PI with Kenneth Wong
- TATRC, US Army (2011-2015): \$1.49 Million-  
**Neuro-Performance Study of Sleep (lack of) on Behavior**  
Role: P.I.
- Veterans Affairs through Tiag and RGI (2011-2012): \$270,000  
**Management Leadership for Open Source Electronic Health Record Agent**  
Role: P.I. Serving CEO of OSEHRA
- Department of Defense: (2003): \$7.1 Million  
**Periscopic Surgery**  
To develop a series of image-guided robotic systems for surgical and rehabilitative medicine

Role: Co-P.I.

- National Library of Medicine: (2003-2007): \$6.5 Million  
**Project Sentinel**  
To develop IT for information sharing for normal disease surveillance and emergency operations  
Role: PI
- Department of Defense: (2003): \$4.0 million  
**Medical Vanguard Diabetes Management Project**  
Internet-based diabetes management system for the US Navy and American Indians  
Role: PI
- Department of Defense (2003): \$7.1 Million  
**Project Argus Research**  
Global disease surveillance based on open-source multimedia sources  
Role: Co-P.I.
- National Library of Medicine (2004): \$200,000  
**Refugee Health Information Network**  
Electronic document management for refugee health  
Role: PI
- Department of Defense (1996): \$12 Million  
**Project Vanguard**  
Advance Medical Technology and Network Systems Research for PACS and Teleradiology  
Role: PI
- Dept of Health and Human Services, (2002): \$395,408  
**Project SRIN: secure teleradiology**  
Teleradiology Project with Avera Health System  
Role: Co-P.I.
- National Library of Medicine (2003): \$2.8 Million  
**“Project Phoenix: Scrutinizing a Telemedicine Testbed”**,  
Telemedicine Project for Kidney Dialysis Service  
Role: P.I.
- Medicare (2000): \$6.0 Million  
**Medicare Demonstration Project for Coordinated Care of Congestive Heart Failure Patients**  
Demonstrating Coordinated Care with the use of telehealth in home monitoring of CHF patients  
Role: P.I.