

# Noah Lee, Ph.D.

Meta Platforms, Inc.

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<https://lee-noah.github.io/>

## SUMMARY

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Noah Lee is currently a Senior Principal Research Data Scientist for the Infrastructure Data Science team at Meta Platforms, Inc. He serves as a technical lead for various strategic key initiatives to help teams turn data into decisions and solutions to optimize performance, reliability, and productivity at scale.

His research spans various topics at the intersection of machine learning, software engineering, and biomedical engineering. He has made significant contributions to the field of retinal, cardiac, and cancer image analysis with applications to blindness, heart disease, and diagnostic cancer treatment. His work is strongly interdisciplinary and his former research projects span the spectrum of biomedical engineering, neuro engineering, machine learning, data mining, medical image analysis, computer aided diagnosis, health care technology and clinical healthcare applications. He served as a lead researcher and contributor for several funded NEI, NMH, and NIH grants of over \$10+ million dollars. Part of his research built the foundation for funded grant applications in response to the American Recovery and Reinvestment Act of 2009. Lately, his research focus spans the intersection of machine learning and software engineering. He has published more than 35 papers at the top research venues such as TPAMI, KDD, AAAI, PLoS, MICCAI, ISBI, IOVS.

He has served in the Program Committee for CAIN 2022 and served as an invited reviewer for over 60+ papers from 13+ different publishers. He has 5 patents and according to Google Scholar has been cited over 1,100+ times with a h-index of 17. He received his PhD from Columbia University and did his post-doc at the Columbia University Medical Center.

## AWARDS AND FELLOWSHIPS

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Nominated as a candidate for the IBM Ph.D. fellowship program for exceptional Ph.D. students	<b>2008</b>
Graduate Research Fellowship recipient, Columbia University	<b>2005 - 2011</b>
Graduated <i>summa cum laude</i> from Computer Science Department of University of Applied Sciences	<b>2004</b>
Honors medal recipient for excellent student undergraduate thesis award	<b>2004</b>

## RESEARCH EXPERIENCE

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**T. J. IBM Watson Research Center - Hawthorne, NY**

*PhD Fellow*

**May 2008 – Aug 2008**

**Heffner Biomedical Imaging Laboratory, New York, NY**

*Graduate Research Assistant*

**May 2005 – May 2011**

**Siemens Corporate Research - Princeton, NJ**

*R&D Intern*

**May 2004 – Aug 2007**

## **WORK EXPERIENCE**

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**Meta Platforms, Inc. – Menlo Park, USA**

*Senior Principal Research Data Scientist (Promotion)*

*Principal Research Data Scientist*

**Jul 2019 – current**

**Samsung Electronics America - Mountain View, USA**

*Director (Head of Business and Operations Analytics) (Promotion)*

*Senior Manager (Promotion)*

**Aug 2017 – Jun 2019**

**Samsung Electronics - Korea**

*Senior Professional (Promotion)*

*Senior Engineer*

**Apr 2015 – Jun 2017**

**1010 Data - New York, USA**

*Senior Software Engineer (Promotion)*

*Software Engineer (Promotion)*

*Quantitative Analyst*

**Oct 2011 – Feb 2015**

**Columbia University Medical Center, New York, USA**

*Postdoctoral Research Scientist*

**Jul 2011 – Oct 2011**

**Innovation Technologies - Seoul, Korea**

*R&D Intern*

**Apr 2002 - Aug 2002**

**WhyFire Media - Berlin, Germany**

*Co-Founder, CTO*

**Oct 1999 – Jan 2004**

## **PATENTS**

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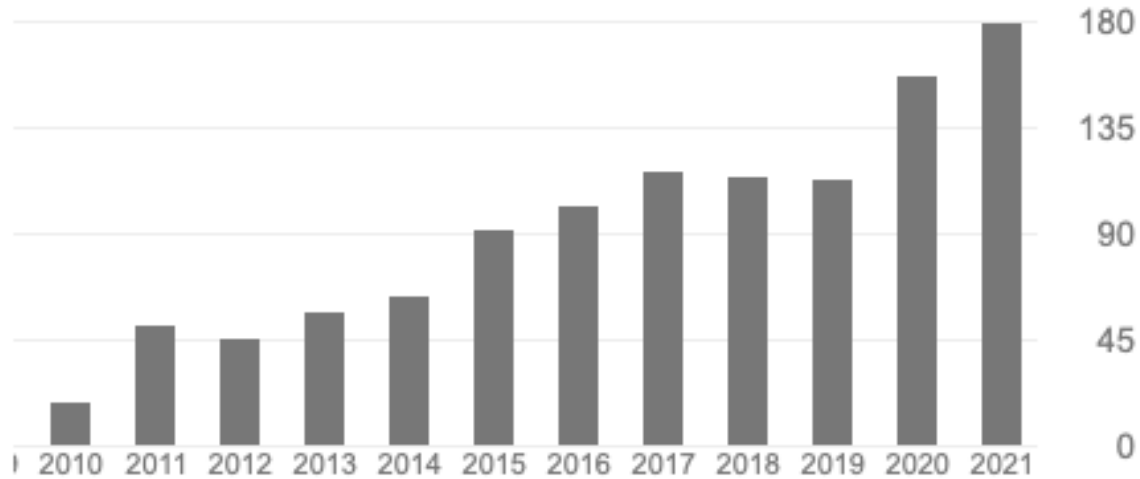
- Code quality prediction under super extreme class imbalance or resource constraints; Inventors: **Noah Lee**, R. Abreu, N. Nagappan; Patent number: US17543577
- Method for providing action guide information and electronic device; Inventors: **Noah Lee**, D. G. Kim, K. Y. Ryu, C. K. Lee, D. Rim, M. H. Jang, P. Prabakaran, D. H. Roh, J. W. Chun; Patent number: US20180345081A1
- Mining temporal patterns in longitudinal event data using discrete event matrices and sparse coding; Inventors: S. Ebadollahi, J. Hu, M. S. Kohn, **Noah Lee**, R. K. Sorrentino, J. Sun, F. Wang; Patent number: US20120191640A1
- Vascular reformatting using curved planar reformation; Inventors: **Noah Lee**, Matthias Rasch, Patent number: US20060122539A1
- Method and System for Interactive Segmentation of Retinal Disorders; Inventors: **Noah Lee**, T. Smith, A. F. Laine; Invention report recommended for patent application by Columbia Technology Ventures, 2009.

## **PUBLICATIONS**

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I have published 35+ referred conference and journal publications. My papers have been cited 1,100+ times with an h-index of 17 at the following venues:

- Public Library of Science (PLoS)
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- Knowledge Discovery and Data Mining (KDD)
- Association for the Advancement of Artificial Intelligence (AAAI)
- IEEE Transactions on Medical Imaging (TMI)
- International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
- IEEE International Symposium on Biomedical Imaging (ISBI)
- Society of Photographic Instrumentation Engineers Medical Imaging (SPIE)
- Association for Research in Vision and Ophthalmology (ARVO)
- IEEE Engineering in Medicine and Biology Society (EMBS)
- International Congress of the IUPESM
- IEEE EMBS Neural Engineering (NER)
- IEEE Signal Processing Society Conference on Signals, Systems and Computers (ASILOMAR)
- Journal of Investigative Ophthalmology and Visual Science (IOVS)
- Journal of IEEE Reviews in Biomedical Engineering (RBME)



My Google Scholar link can be found here: [https://scholar.google.com/citations?user=o1\\_ASDYAAAAJ&hl=en](https://scholar.google.com/citations?user=o1_ASDYAAAAJ&hl=en)

1. A. Klein, S. Gosh, F. Bao, J. Giard, Y. Haeme, E. Stavsky, **Noah Lee**, B. Rossa, M. Reuter, E. Neto, A. Keshavan: Mindblogging morphometry of human brains. PLOS Computational Biology, Feb 2017.
2. B. Ong, **Noah Lee**, W. Lee, E. Pearce, S. Sivaprasad, C. Klaver, R. Smith, N. Chong: Optimisation of an automated drusen-quantifying software for the analysis of drusen distribution in patients with age-related macular degeneration. *Eye (London, England)*. 27: 554-60.
3. F. Wang, **Noah Lee**, J. Hu, J. Sun, S. Ebadollahi, A. Laine: A framework for mining signatures from event sequences and its applications in healthcare data, 2013 TPAMI.
4. F. Wang, **Noah Lee**, J. Hu, J. Sun, S. Ebadollahi: Towards heterogeneous temporal clinical event pattern discovery: a convolutional approach. 2012, KDD.
5. F. Wang, **Noah Lee**, J. Sun J. Hu, S. Ebadollahi: Automatic group sparse coding, 2011 AAAI.
6. **Noah Lee**, A. Laine, J. Hu, F. Wang, J. Sun, S. Ebadollahi: Mining electronic medical records to explore the linkage between healthcare resource utilization and disease severity in diabetic patients. 2011, HISB.
7. **Noah Lee**, A. Laine, A. Klein: Towards a deep learning approach to brain parcellation, 2011 ISBI.
8. A. Fawzi, **Noah Lee**, J. Acton, A. Laine, R. Smith: Recovery of macular pigment spectrum in vivo using hyperspectral image analysis, *J Biomed Opt* 2011 Oct;16(10):106008.
9. J. Chen, J. Tian, **Noah Lee**, J. Zheng, R. Smith, A. Laine: A partial intensity invariant feature descriptor for multimodal retinal image registration, *IEEE Trans Biomed Eng* 2010 Jul 18;57(7):1707-18. Epub 2010 Feb 18.
10. R. Smith, M. Sohrab, N. Pumariega, Y. Chen, J. Chen, **Noah Lee**, A. Laine: Dynamic soft drusen remodeling in age-related macular degeneration, *Br J Ophthalmol* 2010 Dec 7;94(12):1618-23.
11. **Noah Lee**, A. F. Laine, G. Marquez, J. Levsky, J. Gohagan, Potential of computer aided diagnosis to improve CT lung cancer screening, *Reviews of Biomedical Engineering*, to appear, 2009.

12. **Noah Lee**, J. Caban, S. Ebadollahi, A. F. Laine, Interactive Segmentation in Multi-Modal Medical Imagery using a Bayesian Transductive Learning Approach, Proceeding of SPIE Medical Imaging, Florida, U.S.A, vol. 7260, 72601W, 2009.
13. R.T. Smith, N.L. Gomes, G. Barile, M. Busuioc, **Noah Lee**, A.F. Laine, Lipofuscin & Autofluorescence Metrics in progressive STGD, Invest. Ophthalmol. Vis. Sci., doi:10.1167/iovs. 08-2448, 2009.
14. **Noah Lee**, A.F. Laine, S. Ebadollahi, R.L. DeLaPaz, Bayesian Transduction and Markov Conditional Mixtures for Spatiotemporal Interactive Segmentation, Proceedings of 4th International IEEE EMBS Conference on Neural Engineering, 2009.
15. **Noah Lee**, A.F. Laine, R.T. Smith, Bayesian Transductive Markov Random Fields for Interactive Segmentation in Retinal Disorders, Proceedings of 11th International Congress of Medical Physics and Biomedical Engineering, 2009.
16. J. Caban, **Noah Lee**, S. Ebadollahi, A. F. Laine, Concept detection in longitudinal brain MR images using multi-modal cues, Proceeding of 6th IEEE International Symposium on Biomedical Imaging (ISBI): From Nano to Macro, 2009.
17. N.M. Pumariega, M.A. Sohrab, J.Chen, **Noah Lee**, A. Laine, R. T. Smith<sup>1</sup>, Multimodal Image Registration Using the Fully Automated Harris-Invariant Feature Descriptor Scientific Poster, Association for Research in Vision and Ophthalmology, Fort Lauderdale, 5/2009.
18. M. Busuioc, R.T. Smith, R.P. Post, J. Chen, **N. Lee**, J. Shi, A. Laine. User Interactive Retinal Image Analysis: Realizing the Practical Digital Promise Scientific Poster, Association for Research in Vision and Ophthalmology, Fort Lauderdale, 5/2009.
19. Smith RT, Sajda P, Fawzi AA, Kashani A, **Lee Noah**, Bearman G, Wilson D,JohnsonB, Martin G, Humayun M, Drusen Spectral Signatures via Unsupervised Spectral Unmixing of Snapshot Hyperspectral Images, Scientific Paper, International symposium for Imaging in the Eye, Fort Lauderdale, April 2009.
20. R. T. Smith, N. Gomes, M. Busuioc, **Noah Lee**, A. Laine, Autofluorescence image analysis in age-related macular degeneration (AMD) and stargardt disease (STGD) , IEEE Signal Processing Society, Asilomar Conference on Signals, Systems and Computers, pp. 651-654, 2008.
21. **Noah Lee**, R. T. Smith, A. F. Laine, Interactive Segmentation for Geographic Atrophy in Retinal Fundus. Images, Proceedings of Asilomar Conference on Signals, Systems and Computers, IEEE Signal Processing Society, pp. 655-658, 2008

22. **Noah Lee**, A. F. Laine, T. R. Smith, Coarse to Fine Segmentation of stargardt rings using an expert guided dual ellipse model, Proceeding of 30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS), pp. 2250-2253, Vancouver, Canada, 2008.
23. R.T.Smith, M. Busuioc, **Noah Lee**, A. F. Laine, Autofluorescence metrics in stargardt disease, Association for Research in Vision and Ophthalmology (ARVO), 2008.
24. M. Busuioc, R.T. Smith, **Noah Lee**, Ontologies used in a Clinical database for controlled field entries, Association for Research in Vision and Ophthalmology (ARVO), 2008.
25. R. T. Smith, G. Barile, N. Gomes, M. Busuioc, **Noah Lee**, A. Laine. Lipofuscin and Autofluorescence Metrics in Progressive Stargardt Disease. World Ophthalmology Conference, Hong Kong, Scientific Poster, July 2008.
26. **Noah Lee**, A. F. Laine, R. T. Smith, Learning Non-Homogenous. Textures and the unlearning problem with application to drusen detection in retinal images, Proceeding of 5th IEEE International Symposium on Biomedical Imaging (ISBI): From Nano to Macro, pp. 1215-1218, 2008.
27. **Noah Lee**, H. Tek, A. F. Laine, True-False Lumen Segmentation of Aortic Dissection using Multi-Scale Wavelet Analysis and Generative-Discriminative Model Matching, Proceedings of the SPIE, Medical Imaging, vol. 6915, pp. 69152V-69152V-11, 2008.
28. R.T. Smith, G. Barile, N. Gomes, M. Busuioc, R. Allikmets, **Noah Lee**, A. F. Laine, Lipofuscin and Autofluorescence Metrics in Progressive Stargardt Disease, Proceedings of the Association for Research in Vision and Ophthalmology (ARVO), 2008.
29. **Noah Lee**, A. Laine, R. Theodore Smith, A hybrid segmentation approach for geographic atrophy in fundus. auto-fluorescence images for diagnosis of age-related macular degeneration, Proceedings of 29th Annual International Conference of the IEEE, Engineering in Medicine and Biology Society (EMBS), 2007.
30. **Noah Lee**, A. F. Laine, R. T. Smith, M. Busuioc, Retinal vessel segmentation using multi-scale wavelet frame analysis, The Association for Research in Vision and Ophthalmology (ARVO) , 2007.
31. M. Busuioc, R.T. Smith, **Noah Lee**, R. Allikmets, Database for correlation of demographic, clinical photo documentation and genetic data, Association for Research in Vision and Ophthalmology (ARVO), 2007.

32. R.T. Smith, M. Busuioc, **Noah Lee**, A.F. Laine, S. Schmitz-Valckenberg, F.G. Holz, Autofluorescence and Geographic Atrophy, Association for Research in Vision and Ophthalmology (ARVO), 2007.
33. M. Busuioc, J. Koniarek, J. Chan, **Noah Lee**, S. Du, R.T. Smith, Image Registration and Supervised Automatic Drusen Segmentation for use in Clinical Studies, Association for Research in Vision and Ophthalmology (ARVO), 2006.
34. **Noah Lee**, M. Rasch, Tangential curved planar reformation for topological and orientation invariant visualization of vascular trees, Proceedings of the 28th Annual International Conference IEEE Engineering in Medicine and Biology Society (EMBS), pp. 1073-1076, New York City, U.S.A., 2006.
35. **Noah Lee**, A. F. Laine, R. T. Smith, I. Barbazetto, M. Busuioc, Level set segmentation of geographic atrophy in macular autofluorescence images, The Association for Research in Vision and Ophthalmology (ARVO), 2006.
36. **Noah Lee**, M. Rasch, Projective reformation for topological and rotation invariant visualization of vascular trees, World Congress on Medical Physics and Biomedical Engineering, 2006.
37. M. Busuioc, J. Koniarek, J. Chan, **Noah Lee**, S. Du, R.T. Smith. Ophthalmology & Biomedical Engineering, Columbia University. Image Registration and Supervised Automatic Drusen Segmentation for Use in Clinical Studies. Scientific Poster, Association for Research in Vision and Ophthalmology, Fort Lauderdale, 5/2006.
38. **Noah Lee**, A color code for object identification and a method for encoding and decoding, Diploma Thesis.

## INVITED REVIEWS

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I am a reviewer for 13+ different publishers including peer-reviewed journals, international conferences, and magazines and provided expert review in evaluating research work from peers for over 60+ research articles.

- 2010
  - IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)
  - IEEE Transactions on Medical Imaging (TMI)
- 2009
  - IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)
  - IEEE Engineering in Medicine and Biology Society (EMBC)
  - International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
  - Journal of Visual Communication and Image Representation (JVCI)
  - International IEEE EMBS Conference on Neural Engineering (NER)

- 2008
  - International Conference on Bio-Inspired Systems and Signal Processing (BIOSIGNALS)
  - IEEE Engineering in Medicine and Biology Society (EMBC)
  - International Journal of Computer Assisted Radiology and Surgery (IJCARS)
  - International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
  - IEEE Transactions on Image Processing (TIP)
  - IEEE Transactions on Medical Imaging (TMI)
- 2007
  - IEEE International Conference on Computer Vision (ICCV)
  - IEEE Engineering in Medicine and Biology Society (EMBC)
  - IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)
  - IEEE Transactions on Medical Imaging (TMI)

## PROFESSIONAL MEMBERSHIPS

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|---|----------------------|
| ▪ The Institute of Electrical and Electronics Engineers (IEEE)    | Member (2008 - 2011) |
| ▪ The Engineering in Medicine and Biology Society (EMBS)          | Member (2008 - 2011) |
| ▪ The German Academic International Network (GAIN)                | Member (2008 - 2011) |
| ▪ The Society of Photographic Instrumentation Engineers (SPIE)    | Member (2008 - 2011) |
| ▪ The Korean American Scientists and Engineers Association (KSEA) | Member (2009 - 2011) |

## FUNDING GRANTS

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- **Biomedical Image Engineering of Macular Images (1 R01 EY015520-01A2)**
  - Total Estimated Project Funding: \$1,151,724.00 million
  - Funding Opportunity Announcement (FOA): PA-07-070.
- **Absolute Fundus Autofluorescence in Retinal Degenerations (2 R01 EY015520-06)**
  - Total Estimated Project Funding: \$3,474, 862.00 million
  - Funding Opportunity Announcement (FOA): PA-07-070
- **Mindboggling Shape Analysis and Identification (1 R01 MH 084029-01A1)**
  - Total Estimated Project Funding: \$1,197,960.00 million
  - Funding Opportunity Announcement (FOA): PA-07-070
- **Informatics Platform for Interactive Exploration of Longitudinal Multimodal Data: Brain Tumor Management**
  - Total Estimated Project Funding: \$6,410,617.00 million
  - Funding Opportunity Announcement (FOA): PAR-07-352



## EDUCATION

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### **Columbia University**

**New York, USA**

**May 2011**

- Ph.D. in Biomedical Engineering
- Thesis: Synergizing human-machine intelligence: visualizing, labeling, and mining the electronic health record
- Advisor: Prof. Andrew F. Laine, D.Sc.
- Committee: Dr. T. Smith, Dr. S. Ebadollahi, Dr. P. Sajda

### **Columbia University**

**New York, USA**

**May 2006**

- M.Phil. in Biomedical Engineering
- Advisor: Prof. Andrew F. Laine, D.Sc

### **Berliner Hochschule für Technik (BHT) (University of Applied Sciences)**

**Berlin, Germany**

**Jan 2004**

- Diploma in Media Informatics (GPA 4.0/4.0)
- Graduated with distinction (Summa Cum Laude)
- Thesis: "A color code for object identification and a method for encoding and decoding".

## TEACHING EXPERIENCE

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- Graduate Teaching Assistant, Columbia University

**2005 – 2011**