

# Alexandros Sigaras

Senior Research Associate in  
Computational Biomedicine

1305 York Avenue  
Box 140  
New York, NY 10021

+1 (646) 962-5634  
[als2076@med.cornell.edu](mailto:als2076@med.cornell.edu)  
<https://vivo.med.cornell.edu/display/cwid-als2076>

---

## Research Interests

My scientific focus is on building secure and AI driven high scalable computing solutions in the cloud for genomic analysis focused on healthcare and more specifically cancer care and cancer research. Furthermore, to visualize these complex big data entities, I am also interested in spatial computing, Mixed Reality, Virtual Reality and Augmented Reality as solutions to enable immersive asynchronous remote collaboration and data visualization of healthcare and genomic data.

## Education

- December 2013     **M.S. in Computer Science**, *Columbia University*, Department of Computer Science, Fu Foundation School of Engineering and Applied Science, New York, NY, USA.  
**Track:** Thesis Research Track  
**GPA:** 3.851/4  
**Thesis:** *Surgical Structured Light for 3D Minimally Invasive Surgical Imaging*
- October 2011     **B.S. in Computer Science**, *University of Piraeus*, Department of Informatics, Piraeus, Greece.  
**Track:** Information Systems Track  
**GPA:** 8.5/10  
**Thesis:** *Self Adaptive Robotic Warehouse Management Systems with event and location based triggers*

## Experience

- Weill Cornell  
Medical College
- May 2017 –  
Present
- Senior Research Associate in Computational Biomedicine,  
Institute for Computational Biomedicine, Englander Institute for Precision  
Medicine**
- Lead the design and development of novel software solutions supporting the clinical and research activities at the Joint Clinical Genomics Initiative and at the Englander Institute for Precision Medicine.
  - Lead the development of the virtual and augmented reality program for precision medicine;

- Oversee the design, development, and deployment of containerized solutions for the clinical genomics laboratory management system and data analysis, including QC/QA tools
- Lead the efforts of large scale genomic analysis in the cloud for both clinic and research activities; coordinate the development of artificial intelligence solutions to support the precision medicine knowledge base and the case review and sign out process.

Weill Cornell  
Medical College

**Research Associate in Computational Biomedicine,  
Institute for Computational Biomedicine, Englander Institute for Precision  
Medicine**

April 2015 –  
May 2017

- Lead the search for new ways to leverage technology to advance precision medicine, including the use of Virtual Reality and Augmented Reality
- Responsible for the design and implementation of the informatics infrastructure of the Englander Institute for Precision Medicine (EIPM), including the design and development of new tools to simplify user interaction with the laboratory information management system and the current IT infrastructure of WCM/NYP, collect and analyze user data and system performance within EIPM, and implement tools to report the results of the genomic analysis to the users via genomic portals.

Weill Cornell  
Medical College

**Programmer Analyst,  
Institute for Computational Biomedicine, Englander Institute for Precision  
Medicine**

March 2014 –  
April 2015

Software Development Lead for all clinical and R&D activities of the Englander institution for Precision Medicine.

**Key Responsibilities:** Development of Next-Generation sequencing pipelines, LIS, cancer genomic portals and integrating genomic data to New York Presbyterian's HL7 infrastructure.

Columbia  
University

**Research Assistant (graduate),  
Robotics Lab**

September 2012 –  
March 2014

- **Project 1:** Developed prototype on Surgical Structured Light for 3D minimally invasive surgical imaging.
- **Project 2:** Developed brain computer interfaces for robotic grasping for people with locked-in syndrome.

Microsoft

**Internal Sales Education Specialist**

December 2011 –  
July 2012

Worked closely with universities and K-12 schools in Greece to provide cloud solutions and generally fulfill education institution needs in IT. Recipient of the Language Champion Award for the contribution to the Windows 8 International Review Program.

Microsoft

### Microsoft Student Partner

November 2006 – December 2011 Member of Developers Platform Evangelists (DPE) group. Tasks included: administering the departmental Microsoft Developer Network Academic Alliance (MSDNAA) subscription, organizing technical presentations (for students) involving Microsoft products, advising students entering Microsoft’s worldwide “Imagine Cup” programming contest, and setting up and moderating the studentguru.gr community website. <http://www.studentguru.gr>

## Honors and Awards

November 2015 **Nominee**, Forbes 30 under 30 in the Science and Healthcare categories

July 2012 **Language Champion Award** for Contribution to the Windows 8 International Review Program

June 2012 **Fulbright Scholar**, U.S Department of State’s Bureau of Educational and Cultural Affairs

June 2012 **Scholarship** (for M.S. studies), Harry D. Triantafillu Scholarship Fund Award, Institute of International Education

October 2011 **Salutatorian**, University of Piraeus, Department of Informatics

October 2011 Graduated **summa cum laude**, University of Piraeus, Department of Informatics

November 2010 **Semi-Finalist**, Imagine Cup IT Challenge, Microsoft

December 2009 **Honorary Scholarship**, Hellenic American University

December 2009 **2<sup>nd</sup> place winner**, Athens Startup Weekend 2

November 2008 **Semi-Finalist**, Imagine Cup IT Challenge, Microsoft

## Teaching

### Teaching Assistant

- Created and graded homework, midterms, and final exams; prepared project material and gave lectures (Numbers in parentheses indicate enrollment).

COMS W4733 Computational Aspects of Robotics, Columbia University  
Instructor: Prof. Peter Allen, Fall 2013 (60)

## Certifications

- December 2011 Udacity – Introduction to Artificial Intelligence - (top 10%)
- October 2010 MCP, MCTS - 70-680: Microsoft Technology Specialist – Windows 7, Configuration
- June 2007 MCP, MCTS - 70-680: Microsoft Technology Specialist – Windows Vista, Configuration

## Publications

### Journal Articles

- [J.1] Sailer V, Schiffman MH, Kossai M, Cyrta J, Beg S, Sullivan B, Pua BB, Lee KS, Talenfeld AD, Nanus DM, Tagawa ST, Robinson BD, Rao RA, Pauli C, Bareja R, Beltran LS, **Sigaras A**, Eng KW, Elemento O, Sboner A, Rubin MA, Beltran H, Mosquera JM. Bone biopsy protocol for advanced prostate cancer in the era of precision medicine. **Cancer.** 2018 Mar 1;124(5):1008-1015. doi: 10.1002/cncr.31173. Epub 2017 Dec 19.
- [J.2] Pisapia DJ, Salvatore S, Pauli C, Hissong E, Eng K, Prandi D, Sailer VW, Robinson BD, Park K, Cyrta J, Tagawa ST, Kossai M, Fontugne J, Kim R, **Sigaras A**, Rao R, Pancirer D, Faltas B, Bareja R, Molina AM, Nanus DM, Rajappa P, Souweidane MM, Greenfield J, Emde AK, Robine N, Elemento O, Sboner A, Demichelis F, Beltran H, Rubin MA, Mosquera JM. Next-Generation Rapid Autopsies Enable Tumor Evolution Tracking and Generation of Preclinical Models. **JCO Precis Oncol.** 2017;2017. Epub 2017 Jun 14.
- [J.3] Bose R, Karthaus WR, Armenia J, Abida W, Iaquinata PJ, Zhang Z, Wongvipat J, Wasmuth EV, Shah N, Sullivan PS, Doran MG, Wang P, Patrino A, Zhao Y, Zheng D, Schultz N, Sawyers CL. ERF mutations reveal a balance of ETS factors controlling prostate oncogenesis. **Nature.** 2017 Jun 29;546(7660):671-675. doi: 10.1038/nature22820. Epub 2017 Jun 14.
- [J.4] Beltran H, Eng K, Mosquera JM, **Sigaras A**, Romanel A, Rennert H, Kossai M, Pauli C, Faltas B, Fontugne J, Park K, Banfelder J, Prandi D, Madhukar N, Zhang T, Padilla J, Greco N, McNary TJ, Herrscher E, Wilkes D, MacDonald TY, Xue H, Vacic V, Emde AK, Oschwald D, Tan AY, Chen Z, Collins C, Gleave ME, Wang Y, Chakravarty D, Schiffman M, Kim R, Campagne F, Robinson BD, Nanus DM, Tagawa ST, Xiang JZ, Smogorzewska A, Demichelis F, Rickman DS, Sboner A, Elemento O, Rubin MA. Whole-Exome Sequencing of Metastatic Cancer and Biomarkers of Treatment Response. **JAMA Oncol.** 2015 Jul;1(4):466-74. doi: 10.1001/jamaoncol.2015.1313.
- [J.5] Robinson D, Van Allen EM, Wu YM, Schultz N, Lonigro RJ, Mosquera JM, Montgomery B, Taplin ME, Pritchard CC, Attard G, Beltran H, Abida W, Bradley RK, Vinson J, Cao X, Vats P, Kunju LP, Hussain M, Feng FY, Tomlins SA, Cooney KA, Smith DC, Brennan C, Siddiqui J, Mehra R, Chen Y, Rathkopf DE, Morris MJ, Solomon SB, Durack JC, Reuter VE, Gopalan A, Gao J, Loda M, Lis RT, Bowden M, Balk SP, Gaviola G, Sougnez C, Gupta M, Yu EY, Mostaghel EA, Cheng HH, Mulcahy H, True LD, Plymate SR, Dvinge H, Ferraldeschi R, Flohr P, Miranda S, Zafeiriou Z, Tunariu N, Mateo J, Perez-Lopez R, Demichelis F, Robinson BD, Schiffman M, Nanus DM,

Tagawa ST, **Sigaras A**, Eng KW, Elemento O, Sboner A, Heath EI, Scher HI, Pienta KJ, Kantoff P, de Bono JS, Rubin MA, Nelson PS, Garraway LA, Sawyers CL, Chinnaiyan AM. Integrative clinical genomics of advanced prostate cancer. *Cell*. 2015 May 21;161(5):1215-1228. doi: 10.1016/j.cell.2015.05.001.

## Conference Proceedings

- [C.1] A Reiter, **A Sigaras**, D Fowler, PK Allen. Surgical Structured Light for 3D minimally invasive surgical imaging. **Intelligent Robots and Systems (IROS 2014), 2014 IEEE/RSJ International Conference on**. 2014 November 6, 1282 - 1287. doi: 10.1109/IROS.2014.6942722

## Abstracts

- [A.1] J Catalano, G Cheang, D Pancirer, E Merzier, Y Li, H Tran, **A Sigaras**. 331 The Development of a Custom LIMS: An Introduction and Guide to Successful Implmentation. **American Journal of Clinical Pathology**, Volume 149, Issue suppl\_1, 11 January 2018, Pages S142-S143, doi: 10.1093/ajcp/aqx127.330
- [A.2] H Beltran, K Eng, J Mosquera, **A Sigaras**, A Romanel, H Rennert, M Kossai, C Pauli, B Faltas, J Fontugne, B Robinson, D Nanus, S Tagawa, J Xiang, F Demichelis, D Rickman, A Sboner, O Elemento and M Rubin. Precision cancer medicine program for whole-exome sequencing of metastatic tumors reveals biomarkers of response. **Cancer Research**, Volume 75, Issue 15, 1 August 2015, Page 4745 doi: 0.1158/1538-7445.AM2015-4745

## Posters

- [P.1] **A Sigaras**, S Roshal, A Sboner, M Rubin, O Elemento. **Healthcare Applications for Immersive Remote Collaboration of 3D Medical Data using Virtual and Mixed Reality**. 2017 Startup Symposium, Weill Cornell Medicine, 26 January 2017
- [P.2] E Vinolo, D Alférez, F Amant, D Annibali, J Arribas, M Bentires-Alj, C Bernadó, A Bertotti, A Biankin, A Bruna, E Budinská, A Byrne, C Caldas, O Casanovas, D K. Chang, R B. Clarke, S Corso, G Coukos, V Dangles-Marie, D Decaudin, J Depreeuw, Z Dudová, O Elemento, S Giordano, E Gonzalez-Suarez, H Hafsi, E Hermans, M Hidalgo, G Inghirami, M Jarzabek, S de Jong, J Jonkers, K Kemper, A Křenek, M Kuba, L Lanfrancone, P López Casas, G Mælandsmo, E Marangoni, E Medico, I Miller, K Moran-Jones, B Moranchó, F Nematti, J Henrik Norum, H Palmer, D Peeper, P Pelicci, A Piris-Giménez, M Pujana, S Roman, O Rueda, J Seoane, V Serra, **A Sigaras**, L Soucek, S Tejpar, M Tomas, L Trusolino, A van der Zee, M van de Ven; D Vanhecke, A Villanueva, B Wisman. **The EurOPDX Consortium: Objectives, Achievements & Future Directions**, 1<sup>st</sup> EurOPDX Workshop, Switzerland, 3 October 2016
- [P.3] A Reiter, **A Sigaras** and P Allen. **Surgical Structured Light (SSL) for Real-Time Minimally-Invasive 3D Imaging**. John Jones Symposium, Columbia University, 10 May 2013

## Talks, Lectures

### Invited Talks

- January 2017     **How HoloLens transforms Healthcare**  
Microsoft Reactor, Grand Central Tech, NY  
Host: Microsoft
- November 2008     **Introduction to Robotics with MS Robotics Studio**  
Microsoft, Athens, Greece  
Host: Microsoft
- January 2008     **Robotics Warehouse Project**  
Special presentation to the Chairman of Microsoft, Bill Gates and Konstas Karamanlis, Prime Minister of Greece at the inaugural opening of the Microsoft Innovation Center in Greece  
Host: Microsoft Innovation Center, Greece
- December 2007     **Introduction to Robotics with MS Robotics Studio and LEGO Mindstorms NXT**  
IEEE, University of Patras, Greece  
Host: Prof. Anthony Tzes

### Guest Lectures

- December 2015     **Precision Medicine**  
Bioinformatics II, New York City College of Technology, City University of New York  
Instructor: Prof. Evgenia Giannopoulou
- November 2011     **Intro to Programming in C++ and C#**  
Introduction to Programming, University of Piraeus, Greece  
Instructor: Prof. Ioannis-Christos Panagiotopoulos
- December 2010     **Introduction to Sketchflow**  
E-learning, University of Piraeus, Greece  
Instructor: Prof. Symeon Retalis
- December 2010     **Introduction to Expression Blend**  
Human Computer Interaction, University of Piraeus, Greece  
Host: Prof. Maria Virvou

## Press and Media Coverage

- 03/09/2018     **Microsoft Developer Blog, Voronoi Selection for Cancer Drug Network Visualization in Mixed Reality**

<https://www.microsoft.com/developerblog/2018/03/09/voronoi-selection-cancer-drug-network-visualization-mixed-reality/>

- 10/17/2017 **Channel 9**, *Behind the Scenes: How Weill Cornell Medicine built a chatbot for clinicians to gain fast access to medical data*  
<https://channel9.msdn.com/Blogs/DevRadio/DR1747>
- 09/13/2017 **Microsoft Windows Blogs**, *Making mixed reality: a conversation with Alexandros Sigaras and Sophia Roshal*  
<https://blogs.windows.com/windowsexperience/2017/09/13/making-mixed-reality-conversation-alexandros-sigaras-sophia-roshal/#B0hV1JuJsZolfG2Q.97>
- 06/15/2017 **Microsoft Technical Case Studies**, *Bot gives Weill Cornell clinicians fast access to medical data*  
<https://microsoft.github.io/techcasestudies/bot%20framework/2017/06/15/WeillCornell.html>
- 06/14/2017 **Sociable**, *How Mixed Reality is Transforming Collaborative Cancer Research*  
<https://sociable.co/technology/mixed-reality-cancer/>
- 03/26/2017 **Arirang**, *Special Documentary Smart with Heart*  
<https://www.youtube.com/watch?v=gHa4ddmdCUU>
- Winter 2016 **Weill Cornell Medicine Magazine, Volume 15, Number 3**, *Virtual Vision – 3D technology could offer a potent weapon in cancer care*  
[http://www.weillcornellmedicine-digital.com/weillcornellmedicine/vol\\_15\\_no\\_3?pg=20#pg20](http://www.weillcornellmedicine-digital.com/weillcornellmedicine/vol_15_no_3?pg=20#pg20)
- 01/27/2016 **ABC7 Eyewitness News**, *New 3D goggles help doctors search for mutations in cancerous tumors*  
<http://abc7ny.com/health/new-3d-goggles-help-doctors-search-for-mutations-in-cancerous-tumors/1176716/>
- 07/15/2016 **Weill Cornell News**, *Researchers are Using Virtual Reality to Help Treat Cancer*  
<https://weillcornell.org/news/researchers-are-using-virtual-reality-to-help-treat-cancer>
- 07/13/2016 **CBS New York**, *Seen At 11: Doctors Using Virtual Reality To Treat Cancer Patients*  
<http://newyork.cbslocal.com/2016/07/13/virtual-reality-cancer-patients/>
- 02/24/2016 **Popular Science**, *Here's How Virtual Reality Could Help Doctors Treat Cancer*  
<https://www.popsci.com/how-virtual-reality-could-help-doctors-treat-cancer>
- 05/21/2015 **Science Daily**, *Scientists unveil prostate cancer's 'Rosetta Stone'*  
<https://www.sciencedaily.com/releases/2015/05/150521133732.htm>