



**Exponent**<sup>®</sup>  
Engineering & Scientific Consulting

## Nicolas Batara, Ph.D.

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### Professional Profile

Dr. Batara is a multidisciplinary scientist with expertise in computer software and hardware, data analytics, chemistry, and physics. He has leveraged his experience and educational background to assist clients in a wide variety of matters involving software architecture, cybersecurity, digital forensics, product development, intellectual property, and battery failure.

Dr. Batara's work frequently involves gathering and synthesizing stakeholder and user needs to perform development and analysis of digital and analog electronic systems. He has experience performing cybersecurity risk assessments, software verification & validation, and automating cloud infrastructure for advanced analysis of complex datasets. He has provided consultation on matters involving: software architecture development, insurance claims related to cyberattacks, intellectual property for consumer electronics, embedded systems firmware for medical device safety, failure of integrated circuits, intellectual property for networking equipment, property loss related to product failures, and digital forensics of mobile devices.

Dr. Batara has implemented and maintained software solutions for various applications including text extraction and text analytics for heterogeneous document sets, SQL databases, web hosting, redundant data storage, advanced data analysis, and scientific computing. He has experience with programming languages and development environments including Python, Java, C/C++, SQL, Matlab, Tableau, Linux, Windows, and AWS. In addition, he has developed mobile apps for testing cellular network connectivity and eye-tracking user studies for human-computer interactions.

Prior to joining Exponent, Dr. Batara was involved with the development of cloud database infrastructure for streaming IoT data. There, he contributed to a Python-based API for interfacing with AWS cloud infrastructure. Separately, he served as an internal computational consultant and systems administrator for two research groups at Caltech.

Dr. Batara completed his Ph.D. at Caltech where his thesis work was centered on developing computational simulation and analysis software tools for applications in nanophotonics and photo-electrochemical deposition of semiconductors. Additionally, he utilized experimental techniques to refine his computational tools. In addition, his research experience includes organic photovoltaic devices, bacterial protein isolation, and characterization.

### Academic Credentials & Professional Honors

Ph.D., Materials Science, California Institute of Technology (Caltech), 2017

M.S., Materials Science, California Institute of Technology (Caltech), 2014

B.S., Chemistry, University of California, Santa Barbara, 2011

## Licenses and Certifications

Amazon Web Services (AWS) Cloud Practitioner # 9KNR8SDKMJ141K5Y

## Prior Experience

Open Source Developer, Fineo, 2016-2017

Internal Software & IT Consultant, Systems Administrator, California Institute of Technology, 2012-2016

Graduate Research Assistant, California Institute of Technology, 2012-2016

Undergraduate Research Assistant, University of California Santa Barbara, 2010-2011

Undergraduate Research Assistant, University of California Santa Barbara, 2008-2009

## Professional Affiliations

IEEE Std. 2301: Guide for Cloud Portability and Interoperability Profiles (CPIP). IEEE-SA, 2020

Materials Research Society (Member)

IEEE (Member)

IEEE Computer Society (member)

## Publications

Getting Your Head In The Cloud? Achieving Digital Resilience in the Cloud Era. April 30, 2020.

Yao Y, Lee KT, Sheng X, Batara NA, Hong N, He J, Xu L, Hussain MM, Atwater HA, Lewis NS, Nuzzo RG, Rogers JA. Porous Nanomaterials for Ultrabroadband Omnidirectional Anti-Reflection Surfaces with Applications in High Concentration Photovoltaics. *Advanced Energy Materials* 2017; 7:1601992.

Carim AI, Batara NA, Premkumar A, May R, Atwater HA, Lewis NS. Morphological Expression of the Coherence and Relative Phase of Optical Inputs to the Photoelectrodeposition of Nanopatterned Se-Te Films. *Nano Letters* 2016; 1:2963.

Carim AI, Batara NA, Premkumar A, Atwater HA, Lewis NS. Polarization Control of Morphological Pattern Orientation During Light-Mediated Synthesis of Nanostructured Se-Te Films. *ACS Nano* 2015; 10:102.

Carim AI, Batara NA, Premkumar A, Atwater HA, Lewis NS. Self-Optimizing Photoelectrochemical Growth of Nanopatterned Se-Te Films in Response to the Spectral Distribution of Incident Illumination. *Nano Letters* 2015; 15:7071.

Sadtler B, Burgos SP, Batara NA, Beardslee JA, Atwater HA, Lewis NS. Phototropic Growth Control of Nanoscale Pattern Formation in Photoelectrodeposited Se-Te Films. *Proceedings of the National Academy of Sciences* 2013; 110:19707.

Treat ND, Varotto A, Takacs CJ, Batara NA, Al-Hashimi M, Heeney MJ, Heeger AJ, Wudl F, Hawker CJ, Chabynyc ML. Polymer-Fullerene Miscibility: A Metric for Screening New Materials for High-Performance

Organic Solar Cells. Journal of the American Chemical Society 2012; 134:15869.

Varotto A, Treat ND, Jo J, Shuttle CG, Batara NA, Brunetti FG, Seo JH, Chabiny ML, Hawker CJ, Heeger AJ, Wudl F. 4-Fullerene Derivatives: Tuning the Properties of the Electron Transporting Layer in Bulk-Heterojunction Solar Cells. Angewandte Chemie International Edition 2011; 50:5166.

Brunetti FG, Varotto A, Batara NA, Wudl, F. "Deconvoluted Fullerene" Derivatives: Synthesis and Characterization. Chemistry-A European 2011; 17: 8604.

### **Presentations**

Targeted Hacking and Ransomware. Ohio Association of Civil Trial Attorneys (OACTA). March 9, 2021, at 9 AM PT.

Targeted Hacking and Ransomware. How Perpetrators Get In and Out and How You Can Protect Yourself Exponent Webinar. October 27, 2020 at 9 AM PT.

Sadtler B, Batara NA, Burgos SP, Carim AI, Atwater HA, Lewis NS. Light-Directed Growth of Complex Three-Dimensional Nanostructures in Photoresponsive Chalcogenide Films: Comparison of Nanophotonic Models and Experiments. Materials Research Society Spring Meeting, San Francisco, CA 2014.

Carim AI, Batara NA, Prekumar A, Atwater HA, Lewis NS. Light Directed Synthesis of Nano-Patterned Semiconductor Films. Poster Presentation, Energy Frontier Research Center PI Meeting, Washington DC, 2015.

Batara NA, Sonal KP, D'Andrade BW. Maritime Cybersecurity. International Marine Claims Conference Dublin 2019.