

**“Cloud-Scale Genomic Signal Processing for Robust Large-Scale Cancer Microarray Data Analysis”  
Benjamin Harvey, DSc Candidate, Computer Science  
Bowie State University**

**Thursday, Apr. 23, 2015 @ 3:30 – 4:45 PM, CSB - Room 210**

Benjamin Harvey is a doctoral student of the Computer Science Department at Bowie State University. He holds a M.Sc. in Computer Science from Bowie State University, a Cryptologic Computer Science Certificate from the University of Maryland Baltimore County in conjunction with the Naval Post-Graduate School, and a B.S. in Pre-Med./Computer Science from Mississippi Valley State University. He currently holds a position with the Department of Defense as a Cloud Lead for Information Assurance (IA) analysis. He brings over 5 years of experience designing and implementing intelligence, cloud and healthcare software solutions with over 6 years of experience researching genetics and bioinformatics clinical technologies.

**Abstract:** As microarray data available to scientists continues to increase in size and complexity, it has become overwhelmingly important to find multiple ways to bring inference through the analysis of Large-Scale Cancer Genomic (LSCG) microarray data that is useful to scientists. This study presents a novel methodology that uses parallel one-dimensional wavelet based denoising to initialize a threshold for elucidation of significantly expressed genes for classification. Additionally, this research introduces a "Tipping Point" gauge (TPG) for adaptive selection of optimal wavelet decomposition levels. Finally, this study utilizes the TPG's performance values for machine learning parameterization (MLP) for optimal classification and was implemented and encompassed within cloud-based distributed processing environment. The results proved that one-dimensional parallel cloud-scale wavelet denoising, gene expression thresholding, TPG adaptive level selection and MLP increased the computational performance and enabled the generation of higher quality LSCG microarray images which led to more accurate classification results.

Contact Dr. Soo-Yeon Ji ([sji@bowiestate.edu](mailto:sji@bowiestate.edu)) if you have any question.