A. PERSONAL INFORMATION	
Name: James P. LaRue	james@jadcosignals.com
Signal Processing Scientist	www.DataPlasticity.com
B. PROPOSED POSITION AND AVAILABILITY	
Research and Development in Biomedical Field	

C. RELEVANT QUALIFICATIONS AND SPECIALTIES

Dr. LaRue has a Ph.D. in engineering and applied science and 15 years of experience supporting the Air Force Research Laboratory (AFRL) Information Directorate, Information Intelligence Systems and Analysis, Intelligence Integration and Transition Branch (AFRL/RIEC), Air Force Office of Scientific Research (AFOSR), Navy Space and Naval Warfare Systems Command (SPAWAR), Defense Advanced Research Projects Agency (DARPA), Naval Research Lab (NRL) Stennis Space Center (SSC), and commercial entities. His experience developing and testing neural networks for biometric analysis of fingerprints will be valuable in reviewing these research approaches for completeness and scientific validity. He has an active patent application for a machine learning (ML) enhancement tool architecture that combines convolutional neural networks and association memory matrices to reduce ML training and execution time. In support of DARPA, Dr. LaRue performed research directed toward the AFRL HUMINT Directorate for operator training; he applied computer vision to media exploitation and advanced new concepts in computer vision filters for image processing. He has an interim Secret clearance. Other qualifications include:

Ability to proactively manage multiple, concurrent tasks: Proactively managed as many as three concurrent tasks for AFRL/RIEC related to biometric recognition (voice), ML, classified research, statistical analysis, information assurance/authentication, and systems engineering. Proactively managed as many as three concurrent tasks for SPAWAR related to ML, statistical analysis, systems engineering, and sensor development, including providing Channel Model Parameterization for Integration of Range-Dependent Propagation High-Frequency (HF) Pathloss Calculations with Network Simulation Software.

Two years' experience in the Intelligence Community (IC), including experience with requirements, CONOPS, and transition: Has more than 4 years of experience with requirements and transition in the IC, in particular at the AFRL and DARPA. For the AFRL/RIEC and U.S. Army Research, Development, and Engineering Command (RDECOM), applied advanced statistical processing of Tsallis entropy and blind source separation with an advanced biometric technique of cepstrum to detect transitions in classified structured signals of interest, including channel mixtures of voice, digital modulation, and noise. Developed code for transition into RDECOM SOMBRERO and AFRL Kestrel SIGINT suites. For DARPA performed research directed towards AFRL HUMINT directorate for operator training, applied associative memory matrix (AMM) computer vision technique on For Official Use Only (FOUO) media. Independently reviewed SPAWAR Systems Center Atlantic Competency Aligned Organization Concept of Operations (CAO CONOPS).

Experience managing a multi-agency, multi-disciplinary test and evaluation team: For the AFRL Blind Entropic Bit Stream Recovery (BEBR) project, was technical manager for multi-agency and contractor research, development, test, and evaluation (RDT&E) team from AFRL/RIEC, RDECOM, AFRL-Sensors Directorate (SN), CACI, SI International, Rome Air Development Center (RADC) Applied Research Lab (ARL)–Penn State, Cornell University, and State University of New York Institute of Technology (SUNYIT). This multi-disciplinary team of subject matter experts (SMEs), engineers, developers, and scientists performed 80% R&D and 20% T&E.

D. EMPLOYMENT HISTORY AND EXPERIENCE

Date: September 2011 – Present [37 months]	**Company: James LaRue dba JADCO Signals**

01/2016–Present, Preventice Solutions, Electrocardiogram (EKG) Recording Segmentation Project, Algorithm Engineer. Serves as lead investigator for pre-production segmentation of 200,000 EKGs received daily. Technique uses biometric measures to detect QRS complexes in corrupted 24-second snapshots. Specialized algorithms in ML, Fourier, and Wavelet analysis are designed primarily through advanced data visualization. Certified in Preventice Solutions basic EKG Interpretation exam.

01/2015–09/2015, SPAWAR Charleston, Electroencephalograph (EEG) Analysis Project, Consulting Scientist. Assisted with EEG analysis for human-computer interface analysis. Developed test equipment calibration procedures. Led 2015 summer student program for EEG time series segmentation using cepstral coefficients. Applied cepstral processing techniques used in voice processing to heartbeat liveness detection.

01/2014–12/2015, Charter Global, Predictive Analytics for Consumer Behavior Project, Data Scientist. Was on-site lead project manager and lead investigator for commercial medical-based data analytics project. Assisted project manager in coordinating between company transitions partners responsible for business intelligence,

business development, systems architecture, and extraction-transform-load development.

02/2013–03/2013, Neuro Technology, Application of Signal Processing to Fingerprint Neural Network Algorithm Project, Consulting Scientist (Gratis). Applied AMM to fingerprint analysis using neural networks.

10/2012–12/2012, DARPA Innovation House, Computer Vision Applied to Media Exploitation Project, Consulting Scientist. In research directed towards AFRL HUMINT directorate for operator training, applied AMM computer vision technique on FOUO media for object segmentation and identification in "big data" setting. This work advanced new concepts in computer vision filters for image processing

05/2012–08/2012, Medical University of South Carolina, Rat Brain EEG Time Stamp Analysis Project, Consulting Scientist (Gratis). Analyzed medical research on rat brain EEGs through time-stamp data collections and made recommendations in support of the 21 electrode hookup apparatus.

09/2011–09/2012, AFOSR, Biologically Inspired Computer Vision Project, Consulting Scientist. Successfully took a convolutional neural network from a hierarchical framework and placed it into a bidirectional framework. Used the Kohonen/Grossberg/Kosko biologically inspired AMM concept to achieve outcome. Extended Gabor Filtering with "Haar-like" filtering for post–sensor array data exploitation.

Date: August 2008–September 2011[37 months]	**Company: Scientific Research Corporation**

SPAWAR, RDT&E Projects, Senior Scientist. Led team for technical support and research for a Program of Record (POR) transitioning project to incorporate/emulate sensor-to-transceiver engineering specifications into a modeling and simulation study for an ocean-based beyond-line-of-sight (BLOS) HF ground wave ad hoc sensor communications network array. Wrote systems engineering quality assurance plan for Satellite Communications Very Small Aperture Terminal program repair center. Provided technical support and expertise for SPAWAR Transport and Computing Infrastructure Strategic Laboratory Plan. Independently reviewed and summarized technical literature to gather information on emerging technologies and primary technology gaps related to net-centric systems, using sources such as SPAWAR Systems CAO CONOPS, the Federal Report IT Forecast for 2010-2015, and the U.S. Navy report on Command, Control, Communications, Computers, and Intelligence (C4I) Migration to a Service-Oriented Architecture and Common Computing Environment for the PMW-120/Distributed Common Ground System–Navy. Independently reviewed technical SPAWAR C4I Sensor Communications Study on the Navy's Analytical Analysis POR, which incorporated a sensor communications system comprising sensor link, asset management link, command and control, and push/reachback for the Navy PORs of Line of Sight, BLOS, and Satellite Communications.

Date: October 2004–July 2008 [45 months]	**Company: CACI**

AFRL; Tactical Signal Intelligence Technology Project in BEBR, Defense Cryptologic Program Statistical Eigenvector Rotation Transformation Algorithm, and Defense Cryptologic Program Subspace Collection of Orthogonally Rotated Eigenvectors; Senior Engineering Scientist. Directed team of SMEs, engineers, developers, and scientists performing signal processing and code development for product integration into AFRL Kestrel and RDECOM SOMBRERO SIGINT suite. Tested and evaluated prototype live in laboratory system. Co-authored technical publications "Blind Source Separation for Digital Modulation" (Dr. Richard Tutwiler, ARL/Penn State); "Analysis of FSK signals using Voice Recognition" (Edward Cupples, RADC). Demonstrated a specialized multipath mitigation technique using anechoic chambers.

Date: November 2003–October 2004 [11 months]	**Company: NRC National Academies**

AFRL, Research, Post-Doctorate. Investigated RF multipath, money-laundering schemes, phase-cycle slip in Voice over IP (VoIP) communications, and Tsallis entropy with applications to network traffic.

Date: September 2000–November 2003 [38 months]	**Company: NRL SSC**

NRL SSC Acoustics Division, Multipath in Littoral Water Project, Graduate Assistant. Developed blind-deconvolution for multipath algorithm for submarine detection.

E. EDUCATION

Year: 2003	Degree: Ph.D.	Major: Engineering/Applied Science (ENAS)
Granting Institution: University of New Orleans		
Year: 1995	Degree: M.S.	Major: Mathematics
Granting Institution: Tulane University		
Year: 1992	Degree: B.A.	Major: Mathematics/Education
Granting Institution: SUNY Potsdam		

F. CLEARANCES

Clearances Held: Interim Secret	Effective 4/7/2016
Granting Organization: DoD CAF	