WBS 2.2.3: Novel & Innovative Projects

Mission Statement

Novel and Innovative Projects (NaIP accelerates research, scholarship, and education by new communities that can strongly benefit from the use of XSEDE's ecosystem of advanced digital services. The Novel and Innovative Projects team helps to identify scientists, scholars and educators from disciplines that have not yet made significant use of advanced computing infrastructure, who are committed to projects that require XSEDE services and are in a good position to use them efficiently. NaIP staff provides mentoring to these projects, helping them to obtain XSEDE allocations and to use them successfully.

Goals, Metrics & KPIs

Metrics

Metric	Target	Subgoal
Percentage of users on **new** XSEDE grants for non-traditional projects: key performance indicator for XSEDE	35%/yr	Deepen /Extend– Extend use to new communities
Percentage of users on **sustained** (usage at least 10% of allocation) XSEDE grants for non-traditional projects: key performance indicator for XSEDE	33%/yr	Deepen /Extend– Extend use to new communities
Number of new XSEDE projects from target communities generated by NaIP	30/RP	Deepen /Extend– Extend use to new communities
Number of sustained XSEDE projects from target communities mentored by NaIP	25/RP	Deepen /Extend– Extend use to new communities

KPIs

KPI	Target
Percentage of new allocated users from non-traditional disciplines of XSEDE resources and services	35% of newly allocated users from all disciplines during the reporting year.
Percentage of sustained users from non-traditional disciplines of XSEDE resources and services	33% of users from all disciplines, on grants active during the reporting year that have used at least 10% of their allocation.

Team Members

Name	Institution	Position	Focus of Activities	Email
Alan Craig	Shodor	Deputy Manager; Expert	Digital humanities, arts and social science; Augmented Reality; Virtual Reality.	a-craig@illinois.edu
Sudhakar Pamidighantam	IU	Expert	Convergence of simulation and data in chemistry and materials science; gateways	pamidigs@iu.edu
Paul Rodriguez	SDSC	Expert	Data analytics, machine learning	prodriguez@sdsc.edu
Sergiu Sanielevici	PSC	Manager; Expert	Team coordination; Needs analysis and lightweight consulting for potential projects	sergiu@psc.edu
Marcela Madrid	PSC	Expert	Convergence of simulation and data in biophysics	mmadrid@psc.edu

Roberto Gomez	PSC	Expert	Software and workflows; Convergence of simulation and data in physics	gomez@psc.edu
Davide Del Vento	NCAR	Expert	Software and workflows; Convergence of simulation and data in earth sciences	ddvento@ucar.edu
Bryon Gill	PSC	Expert	Data analytics	bgill@psc.edu
Rozita Laghaei	PSC	Expert	Convergence of simulation and data in biophysics	rlagha@psc.edu
Juan Puerto	PSC	Expert	Web services for novel applications	jpuerto@psc.edu
Kelly Pierce	TACC	Expert	Data analytics, machine learning; public health	kpierce@tacc.utexas.edu

Communication & Meetings

Email list: ecss-nip@xsede.org

Meeting Information

Resources

NaIP Strategic Plan

NaIP Data Science Learning Resources

Projects to contact

Keywords to trigger NaIP referrals

SGCI Support for Front-end Gateway Development

New Staff Orientation

- Email list: ecss-nip@xsede.org : request access by email to the NaIP manager: sergiu@psc.edu.
- Staff account STA110013S: request access by email to the Director, ECSS-Projects: blood@psc.edu .

Projects to watch

July-August 2016 New Startups: SES160006 DEB160014 MCB160141 EAR160030

July-August Mentored Projects: CDA160006 OCE150020 DMS160012

September-October 2016 New Startups: IBN160012 ASC160052 CIE160037 MCB160154 DMS160026 NCR160004 CIE160041 ENG160032 ENG160035 DEB160017 ENG160036 DMS160028 HUA160003 CCR160028 CIE160048 BCS160005

November 2016 -January 2017 new startups: ASC160073 ECS160007 DMS160031 IBN160017 ASC160083

February - April 2017 new startups: SES170001 CDA170001 CHE170015 DEB170003 SES170009 ASC170011 CIE170015 HUA170001 MCB170039 ASC170012 DBS170003 SBE170002 MCB170042 ASC170015 CIE170019 ASC170017 ASC170019 BIO170028 CIE170024

May - July 2017: SBE170003 DMS170010 DEB170008 BIO170035 BIO170037 CIE170028 OCE170008 DMS170012 MCB170068 DDM170001 BIO170041 MCB170071 BIO170039 SES170014 BIO170048 CCR170012 EAR170002 CIE170031 ENG170016 CCR170013 CCR170015 HUM170001 ASC170034 OCE170010 BCS170012 SES170016 DMS170015 CIE170036 MCB170094 MSS170026 BIO170064

Aug-Oct 2017: BIO170065 IRI170003 ECS170006 BIO170064 DEB170010 CDA170007 ASC170047 ASC170048 HUM170002 CDA170010 SES170019 CIE170047 BIO170082 BIO170084 SES170021 SES170020 DEB170012 MCB170134 EAR170018 CIE170007

Nov 2017 - Jan 2018: SES170022 DPP170002 CCR170031 IRI170006 ENG170034 CIE170056 SES170025 BIO170104 DEB170016 IRI170007 BIO170110 ASC170073 MCB170162 CCR160012 DEB170017 DBS170013 SES180001

February - April 2018: DMS180001 **ART170002** (ECSS) IRI180001 **ASC170072** (ECSS) CIE170063 ASC170074 SES180002 DMS180008 AST180011 (big data) ASC180009 DMS180011 (deep learning) CHE180011 (deep learning) BIO180015 (ML) BIO180016 ATM180004 (ML) ASC180018 (ML) IRI180003 (ML) CTS180015 (big data) SBE180001 ENG180004 (ML) SES180006 (BD)

May - July 2018: DDM180003 (ML) CCR180014 (AI - ECSS per PB, requesting Anirban be assigned) EAR180005 (ECSS, SGCI?) OCE180009 (ECSS, Lisa L.) ASC180020 (ML) CIE180020 (ML) MCB160174 ASC180021 (workflow performance prediction, ML, SDSC staff) SES180009 CCR180019 DDM180004 (DL) MCB180060 CDA160011 IRI180006 (ML) ASC180025 (BD) OCE160022 (ML, XRAC) IRI180007 (ML) IRI180010 (ML) IBN180007 MCB160026 (Bioinfo ML) MCB180069 (bioinfo) IRI180012 (robotics) MCB160083 (ML/Biophysics) CCR180023 (graph analytics) ASC180034 (ML, genomics, ECSS=1)?? DMS180026 (genomics, statistics, ECSS=1) BCS180015 (Bioinformatics)!! SES180013 (NBER)

August to October 2018: DMR180085 (LS-DYNA and Tensorflow) BCS180016 (medical DL) **MCB180117** CCR180030 (DB) CHE180011 (MD, DL) ECS180008 (ML) **SES180014** (Econ, natural language processing, 20 TB MySQL DB?) MCB180122 (Genomics) DDM180005 (Transportation, Gurobi) – DMS180029 (Bayesian, brain connectome) MCB180126 (multicontrast MR and non-parametric machine learning) CDA180008 (social media patterns) ***HUM180001*** (Historical documents, ML) **DMS180027** (public health) PHY180043 (HEP, ML) ASC180053 (PB) ASC180054 (medical imaging, ML) IRI180020 (ML) IRI180021 (robotics) SES180012 (economics, XRAC ECSS) **DPP180003** (Polar research, image analysis) PHY180046 (LHC, ML) PHY180050 (cosmology, ML) **ASC180008** (DL, energy infrastructure remote sensing, XRAC rejection) IRI180022 (Robotics, ML) MSS180021 (materials, ML) BIO150074 (genomics, ecology) DEB180019 (metagenomics, transcriptomics, arctic studies) MCB180172 (genomics, ecology) DBS180011 (ML, archaeology) MCB180176 (BLAST mis-annotation) SES180011 (economics) DDM180007 (deep learning) DMS180040 (DL) ***SBE180006*** (social network) **S ES180007** (Financial Market Research) **IBN180001** (brain connectome) MCB180182 (medical imaging DL)

11/1/18 to 1/31/19: SES180022 (economics) CCR180059 (MPI-cuda-GIS) MCB180195 (genomics, ecology, data collection) PHY180060 (HEP, dark matter, DL/NN) IRI180028 (Jetstream, natural language processing; text mining; computational linguistics) IRI180026 (robotics) AST180069 (DL in radio astronomy) IBN180020 (echinoderm genome assembly) ECS180015 (ML, wifi sensing) CCR180066 (DL in computational chemistry) IRI180032 (ML, Cryo-EM) IBN170020 (neuroscience) ASC170054 (graph computing) MCB190016 (ML, genomics) SES190007 (statistics, mental health) MCB190018 (DL, population genetics)

2/1/19 to 4/30/19: ASC180051 (Berkeley Container Library) IRI190006 (DL, Robotics) MSS180028 (ML, complex systems) SES190009 (economics) EAR190010 (DL, Geophysics) CDA190001 (DL, pathology) ASC190013 (DL tool development) DEB190002 (ornithology, citizen science) DBS190002 (metagenomics, paleoanthropology) CCR190008 (deep neural networks research) ASC190014 (neural networks, photo DB management) MCB190021 (genomics, AI) SES190003 (XRAC, federal reserve) CHE190022 (optical microscopy, DL) DMS190010 (seismology, DL) ASC190018 (cancer imaging, DL) MCB180081 (genomics) CCR190014 (gene expression, PA Cure, Large Memory) ASC190019 (plant classification, CNN) ASC190020 (3D Scanning and Augmentation, DL) BCS190005 (DL for biomedical imaging) SES190014 (decision science, data privacy) ATM190007 (ML, rainfall distribution) DBS190003 (ML, visual recognition) ASC190027 (Neural Architecture Search, NLP)

5/1/19 to 7/30/19: AST190024 (cosmology, DL) ECS190007 (NLP, infrastructure management) DBS180014 (NLP, machine comprehension) DMS190019 (AI drug repurposing) MCB190067 (ML, gene expression) MCB190065 (ML, gene expression) BIR190003 (ML controlled medical imaging) CDA190007 (agent based simulation, public health) MCB190075 (DL, proteomics) IBN190007 (brain imaging) OCE190009 (data science in satellite observations) ASC190034 (3D image reconstruction, physics based ML) EID180001 (Deep Learning in Geosystems) IRI190011 (speech recognition) MCB190093 (genomics reference trees) MCB190094 (CRISPR, ML) MIP190004 (circuit design, ML) IRI190013 (ML research) IBN180019 (XRAC, RNA sequencing, statistical methods) MCB190114 (SGCI, ML, GAMESS, RNA) PHY190036 (ML, Higgs) ASC190042 (ML, epigenetics) CCR190034 (genetic programming)

8/1/19 to 10/30/19: MCB190119 (gene expression, ML) MCB190120 (protein structure, ML) IRI190014 (NLP, ML) CTS190052 (MD, DFT, ML) CCR190032 (ML, DARPA Hackathon) MCB190126 (predict cancer biomarkers) MSS190019 (dynamic control of unmanned vehicles, AI) SES190017 (Financial Big Data and Machine Learning) AST190040 (astronomy, ML) ATM190020 (lightning strike data) IBN190012 (auditory and visual category learning) IRI190015 (DL theory) ASC190046 (ML, Nanomaterials) EAR190025 (GeoAI) DMS190025 (Meteorological data assimilation) CCR190047 (ML, stem cell microscopy) CCR190050 (ML, metagenomics) CCR190051 (ML, image compression) IRI190017 (CNN, statistics, sepsis prediction) DDM190001 (ML, IC diagnostics) DMR190092 (computer vision DL, additive manufacturing) SBE190004 (human decision making) PHY190040 (ML theory) DMS190028 (Formal Abstracts in Mathematics) CCR190053 (NN, microcontroller units) MCB190144 (Protein Design using CNN) CCR190054 (AI for Image and Signal Processing) IBN190013 (NN, electron microscopy) CCR190056 (V100-accelerated DNA sequence alignment) CCR190057 (deep learning, fMRI) DPP190001 (AI, Polar Science, XRAC, continues startup DPP180003)

11/1/19 to 1/31/20: ECS190014 (wireless communication, NN) SBE190006 (network science) DEB190019 (Phylogeny and Biogeography) IRI190019 (music information retrieval) CCR190059 (Graph Neural Networks) MCB190171 (DL, chromatin organization) AST190059 (cosmology, ML) CDA190013 (DL, neuropathology) CTS190070 (CFD DNS, DL) DMR190116 (DFT force field development, DL) CTS190072 (microfluidics, DL) CCR190064 (mathematics) CCR190027 (quantum computing) DMS190037 (observational study design) CCR180060 (Reinforcement Learning for Self Driving Cars) MSS190026 (DL, dislocation dynamics) DMS190040 (uncertainty quantification) IBN190018 (DL, optogenetic studies) IRI190021 (exobiology, DL) OCE190015 (coastal engineering and management) PHY190053 (quantum computing) IBN190019 (physio-psychology of vision) MCB190184 (DL, Genomics) DMS190041 (mathematics) IRI190023 (ML, ICU risk prediction) SBE190008 (economics, AirBnB) ASC190069 CCR190067 (Turing-completeness of DL) IBN190022 (ML, neuroscience) CCR190069 (Image Translation, Sonography, NN) BIR190005 (NIH Biomedical Data Science Codeathon) IRI200001 (robotics, computer vision) DMS200001 (seismology, Bayesian MC, NN) DMS200003 (oceanography, functional data analysis) IBN200002 (cardiac arrest, ML) IRI200002 (breast cancer, ML) IRI200003 (biomedical computer vision deep-learning) CCR200001 (Entity Linking for Tweets) AST200009 (GPU-accelerated search for distant Solar System objects) DMR200017 (Machine Learning Accelerated Quantum Monte Carlo Method for Fermions) IRI200004 (Meta-Reinforcement Learning) *MCB200022 (genomics, rapid evolution) CTS200013 (MD, GA, DL)*

2/1/20 to 4/30/20: DMS200006 (HIV genomics, ML) IRI200006 (medical robotics, computer vision) ASC200007 (ML on clinical images) MCB200027 (NIH transcriptomic data) DEB200004 (multisource data, Bayesian, holocene species range expansion) IBN200005 (processing ultra-high-resolution diffusion MRI data of terabytes size, ECSS) CTS200016 (Ocean Wave Forecast with Data Assimilation) ASC200005 (Big Data Management and Analysis Course at Cornell) IBN200007(genetic variation, gene expression and neuroimaging phenotypes to inform the etiology of psychopathology) SES200004 (Cooperative Patent Classification using AI) ASC200010 (Diabetic Retinopathy using deep learning) SES200006 (Language in Finance, DL) IBN200009 (Data-driven modeling and simulation of individual variability and adolescent development of the human connectome) DMR200021 (Materials Micro-Structure Image Analysis) DMR200022 (materials, DL) CHE200021 (Quantum Computational Simulations for Computational Chemistry) DMR200023 (Crystal synthesis prediction via deep learning) **ASC200014 (Covid-19 epidemiology, ECSS)** CCR200011 (Personalized Human Activity Recognition using CNNs) DEB200008 (ecology, genomics, ML) MCB200074 (evolutionary genomics, statistics) IRI200009 (Common sense and language for computer vision tasks) EAR200003 (Deep Transfer Learning to Model the Biogeosphere) DEB200005 (Biology-guided neural networks for discovering phenotypic traits) IBN200011 (Deep learning for real-time cognitive state classification using EEG, fNIRS and BSN data) **OCE200008 (ocean science, data visualization, oral history; ECSS)** DEB200012 (phylogenetics, biomechanics, macroevolution) DMR200041 (machine learning potential for 2D materials) **SBE180007 (Fake News Shelf life; ECSS)** SES200010 (ML, corporate bankruptcies)

5/1/20 to 7/31/20: EID200001 (Stormwater Infrastructure Climate Resilience Assessment) EAR200008 (DL dynamic scaling of growing interfaces) IRI200018 (DL, breast cancer therapy) IBN200014 (Image analysis of the role of perineuronal nets in long-term memory consolidation) CCR200004 (Compressing and Accelerating Transformers-based Large-Scale Language Representations) ECS200008 (Post Quantum Public-Key Cryptography) ASC200032 (Reducing Memory Footprint for Extreme-Scale Deep Learning) PHY200019 (ML, particle physics) CCR200029 (Earth Science, Deep Learning, Spatial Structured Models) CCR200032 (Biological inspired Neuronal Network simulator) SES200012 (Empirical Examination of Corporate Rebranding and Trademarks) CCR200033 (Development of an Exemplar Suite for Verifiably Correct HPC Programs) IRI200020 (deep learning classifiers of malware variants) DBS200005 (AI tools for studying infant brain development) CCR200037 (Runtime Data Management on Heterogeneous Main Memory Systems for Deep Learning) DMS200023 (OPTIMIZATION OF ALGORITHMS FOR TRUSTWORTHY CYBER PHYSICAL SYSTEMS) MCB200179 (Big-data Approaches to High-accuracy Protein Structure Prediction on Genomic Scales) IBN200016 (Linear-Time Clustering of Multi-scale Electrophysiological Data for Epilepsy Research) **MCB200187** (Metagenomic sequence identification via shared parameter learning) DDM200004 (Energy Network Partition) CCR200039 (A Complier and Runtime Framework for Generating and Optimizing Irregular Convolutions on GPUs) IRI200021 (Multilingual Representation Learning for Natural Language) SBE200006 (Visual Fashion Recommendation using Social Media Feeds) ATM200014 (Deep Learning for Daily Precipitation and Temperature Downscaling) SES200016 (Video content analysis for customer behavior) SES200017 (Big data, Risk Informed Development in Nile Basin Countries) ASC200039 (Rapid Spatiotemporal Turbulence Modeling with Convolutional Neural ODEs) EAR200010 (global glacier modeling) CDA200011(Temperature, Air Pollution, and Health Burden in the Southern Community Cohort Study) OCE200009 (Metatranscriptome North Pacific Ocean, ECSS, Research) DBS200007 (Predicting the cross-modal language network) DEB200020 (Wringing out moisture from deep learning)

8/1/20 to 10/30/20: SOC200001 (Bayesian Ensemble, Machine Learning, Asset Pricing) EVE200001 (Computer vision and application security) BIO200008 (DL, antibiotic natural products discovery) BIO200011 (Cracking the gene regulatory grammar) CHE200099 (computational chemistry discovery; ML) ELE200002 (Pre-training Transformers for Visual Representation Learning) BIO200019 (Memory quantification in neuron spiking) MCH200006 (Learning materials structural topology optimization using 3D) CIS200018 (Physics-Guided Deep Learning for Spatiotemporal Epidemic Forecasting) CIS200020 (Information Fatigue and Its Impact on Covid-19 Mitigation Efforts) PHY200060 (Radioastronomy survey imaging) SBE200008 (Image Classification Applied to Celebrity Data in Economics and Marketing) MED200003 (Predicting longitudinal outcomes in Alzheimer's Disease) BIO200043 (Building Deep-learned Traction Force Microscopy) CIS200029 (Control of Complex Dynamical Systems) CCR200026 (Graph Neural Networks) AST200016 (Searching for compact binaries) BIO200058 (convolutional neural network, functional genomics) CIS200037 (Interpretable and extendable deep learning model for biological sequence analysis and prediction) BIO200060 (Neurodevelopment of emergent substance use and delinquency behaviors in adolescence) EES200016 (Understanding and Predicting Flash Drought and Heat Wave) EVE200003 (Mathematical Modeling of Fibroblast-Mediated Protection of HER2+ Breast Tumor Cells) MED200007 (Longitudinal Relationship between Small Vessel Disease, Neurodegeneration and Cognitive Decline) BIO200067 (Machine Learning for Personalized Cancer Clinical Applications) ELE200006 (Deep Learning-based Spectrum Sensing in THz Communications)

11/1/20 to 1/31/21: PHY200096 (CFD, ML) CIS200044 (Scalability of DNN Training on Multi-GPU Systems) BIO200070 (Identification and Analysis of Wildlife Species in Field Audio Recordings) CIS200045 (robotics, reinforcement learning) BIO200071 (invasion biology, genomics) BIO200073(Deep Generative Models of Protein Domain Structures) CHE200128 (ML, DFT, biofuel property) MED200010 (Interpretable DL for cancer prognosis using spatial proteomics and transcriptomics) EES200018 (Ocean State Estimation from Data Assimilation Methods) CHE200132 (Deep Learning of Quantum Chemical Hamiltonians) CIS200050 (Spatio-Temporal Social Media Data Analysis for Understanding Public Response to Disease Outbreaks) AGR200002 (a mobile distributed sensor for agricultural crop health measurement) EES200021 (Agrohydro-Climate Modeling) MTH200016 (uncertainty quantification in causal inference and election audits) MCH200023 (Wing Induced Flow in Odor-Guided Flapping Flight) CHE200134 (Artificial Intelligence for Molecular Spectroscopy) MED200013 (basecalling nanopore reads to determine resistance to antibiotics) EES210002 (Seismic Imaging of Active Volcanoes) SOC200005 (Predicting Corporate Default: Research, ECSS) HUM190002 (image analysis of digitized historical movies) CIS210007 (Learning natural type information for decompiled binaries) BIO210012 (Molecular Basis of Embryonic Development) SES190008 (Housing Price, Local Firms, and Wealth Inequality) CIS210012 (Deep Topological Analysis of Biomedical Images) CIS210015 (Performance Evaluation of Sparse Computations on Accelerators) BIO210019 (Investigating molluscan evolution of development (evo-devo) using genomic tools) CIS200032 (The Distant Reader: A Tool for Reading at Scale)

2/1/21 to 4/30/21: MCH210004 (Safer Autonomy Through Novel Machine Learning and Control Mechanisms) BIO210028 (Impact of landscape change on population connectivity and demography in Varecia variegata, the black-and-white ruffed lemur) SOC210002 (Human strategies for solving transfer-learning across multi-feature learning environments) CIS210026 (Machine Learning for Categorizing Satellite Data) CIS210028 (3D Seismic facies classification using Distributed Deep Learning) CIS210029 (Estimation of Location Resolving Power of Indoor Localization Infrastructure) CIS210030 (Using Artificial Intelligence to Predict Fall-risk Leveraging Force-Plate Data) EES210011 (LSTM-based Modeling of Snow Processes over the CONUS) EL E210003 (real-time sensing and computing for wireless security) ECS180013 (Fully Distributed Deep Learning) BIO210036 (Meta-Analysis of Studies of Habitat Fragmentation) CIS210032 (Automatic analysis of honeybee foraging behavior) CIV210003 (Heavy-Duty Electric Delivery Fleets: Optimal Routing) CIS210033 (Deep Learning for Multi-Channel Speaker Localization and Speech Separation) MCH200015 (Data analytics for metal 3D printing) EES210012 (machine learning parameterization of subgrid atmospheric processes) CCR190044 (theoretical foundation of deep learning) BIO210048 (genetics; transcriptional coregulation; Science Gateway) CIS210036 (Force Plate Data Machine Learning Analysis) BIO200019 (Memory quantification in the neuron spiking activities) CIS210037 (Molecular Docking with Physics-Guided Neural Networks) CIS210041 (Near-memory Processing for Graph Mining Applications) CIS210044 (Generalized Causal Representation Transfer for Biased Heterogeneous Data in AI and Fairness) CIS210045 (Unsupervised Image Segmentation from Discriminative Learning) CIS210048 (Assessment of land degradation using Artificial Intelligence) CIS210050 (Best Action Trajectory Stitching) CIS210051 (AI sound synthesis) CIS210053 (ML for High-Performance Communication and I/O Runtimes and Applications) SOC210004 (Consumer Spending and Merchant Revenues) MTH210008 (Machine learning for Maxwell's equations in complex media) CIS210054 (Machine Learning for Quantum Computing) 31

5/1/21 to 7/31/21: DMS190040 (Large Scale Simulations for Conformal Prediction - statistics) CIS210055 (First Responder 3D Indoor Tracking Challenge) CIS210056 (Application of uncertainty quantification for neuroimaging software design, testing, and analysis) CIS210057 (Genome Sequence Modeling for Efficient Subsequence Queries using Advanced Language Models) BIO210076 (Hierarchical Bayesian models for population and biology landscape genetics) CIS210059 (A Continuous Time Model of Video Game Consumption) PHY210049 (Deep learning measurement-induced phase transitions in Clifford circuits (quantum computing)) CIS210024 (3D Medical Image Segmentation with Bayesian Deformable Convolutions) MED210008 (Structural Analysis of Brain Morphology across Geriatric Cohorts) EES210020 (Data-driven Machine Learning for Safe Wind Aware Navigation of small UAVs in Urban Spaces) CIS210062 (Automated Journalism - ML) CIS210065 (Inverse Network Transformations for Efficient Generation of Robust Airfoil and Turbine Enhancements) MTH210010 (Fast high-rank Hessian approximation for Bayesian ice sheet inverse problems) MCH210019 (Effects of Fingerprint Geometry on Tactile Sensing) CIS210066 (Distributed Rendering for Large-Scale Scientific Data) PHY210054 (Convolutional Neural Networks for Nearby Galaxy Velocity Determination) CIS210068 (Movie piracy and local theater density) MCH210021 (Agent-based modeling, Complex system analysis, Electric Vehicles and Fleets) SOC210007 (Consumption Risk Exposure of Firms) MTH210011 (Statistics: Test of independence with modern complex data) OCE170012 (Automated classification of In Situ Ichthyoplankton Imaging System (ISIIS) images using Convolutional Neural Nets) MED210010 (Developm ent of the analysis tools for corneal endothelium) CIS210075 (Neural architecture search with derivative-free optimization) CHM210008 (Uncertainty Quantification for Machine Learning of Catalysts for Chemical Production) ASC170024 (Deep Generative Model for Data Integration: Applications in Bioinformatics) CIS210085 (Hyperspectral Image Segmentation Gateway) BIO210112 (De novo assembly of Amoeba proteus genome using 10x Genomics linked reads) BIO210113 (The Bird Genoscape Project) CHM210010 (Machine Learning-Assisted Materials Discovery to Enhance Water Security) MAT210024 (Combining Machine Learning and Ad Initio Molecular Modelling for A Next-Generation Sensing Platform for Bacterial Metabolomics) NNT210003 (HPC and Machine Learning for Studying Piezoelectric Composite Materials)

8/1/21 to 10/30/21: CIS210088 (Leveraging dense latent variation for improved classification of high-dimensional data) BIO210117 (Longitudinal study of genetic effects and gene-environment interactions in cardiovascular diseases using varying coefficient models) MTH210015 (Mirzakhani transform) MSS19 0025 (Computational Ultrasonic Imaging for Structural Applications) EES210028 (Wave-current interactions on rocky coastlines) BIO210123 (Development of integrative statistical and machine learning approaches to extract therapeutic insight through highly heterogeneous multi-omics data) BIO210129 (Training a new version of AlphaFold2) PHY210097 (A Machine Learning Framework for Analyzing New Radio-wave Cosmology Datasets) CIS210102 (Ide ntify the Social Infodemic at Scale) EES210033 (Geospatial Deep Learning for Food and Water Security) CHM210013 (Predicting antibody stability by molecular simulations and machine learning) CIS210107 (Improved Monte Carlo Tree Search) MTH210018 (Foot-and-mouth disease disease modeling the impact of a potential outbreak and control measures) EVE210011 (Improved spatio-temporal modeling of macro-energy systems) BIO210142 (Computa tional prediction of mechanisms of insect-plant interactions) BIO210143 (Eukaryotic Phylogenetic Profiling) CIS210110 (TwitterBETO: A specialized BERT architecture for conversation threads in Spanish Twitter) BIO210147 (Compost Microbiome Deep Learning) SOC210012 (Flexible neural computation in changing environment across species) PHY210120 (Deep Generative Model on Graphs for the Empirical Modelling of Galaxy Intrinsic Alignments) CIS200 055 (Computational Historical Ontologies) CIS210120 (Explaining Machine Learning Uncertainty for Critical Care) CIS210122 (Detecting Privacy Leakages on Social Media via Big Data and Multimodal Deep Learning) CIS210123 (New Deep Learning Methods for Large-Scale Image Data Analysis)

11/1/21 to 1/31/22: BIO210164 (Exploration of Bioelectrical Circuits for Viable Interventions) BIO210165 (Tracking the diversity and metabolic potential of marine photoautotrophs in a changing ocean) CIS210126 (Ciphertext Generation for Novel Post-Quantum Side Channel Attack) CIS210131 (New Attacks Against Post-Quantum Cryptography) BIO210172 (Study of Ethics and Stakeholder Attitudes towards Molecular Epidemiology) EES210041 (Surface Deformation and Change: Satellite Architecture Performance Evaluation) BIO210186 (Improving Segmentation and Classification Accuracy in Honey Bee Forage Mapping) SOC210016 (Information Flow and the Closing Auction) MAT210039 (Development of a Science Gateway for Machine learning atomistic potentials) CIS220001 (Multi-Modal Patient Timeline Extraction Using Deep Learning Methods) CIS220002 (Contrastive Representation Learning for Automated Analysis of Stimulated Raman Histology Images) MDE220001 (Information theory-based systems approach applied to bulk and single-cell transcriptomics) CIS210014 (Large Scale Self-Supervised Speech and Audio Understanding) MED220002 (Predicting treatment response in late life depression) MCH220003 (Markerless Motion Tracking) EES220005 (Machine Learning Precipitation Closures) EES220006 (Probabilistic Imaging of Africa' s Subsurface)

2/1/21 to 4/30/22: CIS220019 (Unsupervised and Semi-supervised Learning on Tabular data) PHY220016 (Benchmarking of 2D Isometric Tensor Network Algorithms) CIS220020 (Virtual Task Selection in Meta-Learning for Domain Generalization) SOC220002 (Developmental Variations in Corticostriatal Thalamocortical Circuits and their Relationship to Psychopathology) SOC220003 (Dynamic Bank Capital Requirements) MTH220005 (Bootst rapped Higher Criticism for Mass Univariate Testing in Neuroimaging) BIO210033 (Developing Graph Neural Networks to Perturb Omics Signals) CIS2200 28 (Deep learning for analyzing 3D medical images) PHY220024 (Optimal Evolution of Extended Hubbard Models in Quantum Computers) BIO220039 (Mapping brain function across human and nonhuman primate) PEB220001 (Energy Conserving Dynamics for optimization) BIO220044 (Training of BERT models for genome analysis) CIS220037 (Efficient Large-scale Deep Neural Network Training using Tensor Decomposition) CIS220038 (Modeling of oligodendrogenesis using spatial transcriptomic imaging and single-cell RNA sequenced data) CIS220040 (Self-supervised Multimodal Action Recognition for Construction Site Safety Monitoring) CIS220043 (Efficient Compilation and Runtimes for Dynamism in Deep Learning) MED220008 (Cerebellar anatomy in psychiatric disorders) BIO220048 (Processing open-source Non-Human Primate Neuroimaging data) BIO220049 (Learning to Create Any Cell) PHY220044 (Designing High-Tc Superconductors with Density Functional Theory and Deep-learning) CIS220048 (Robust Audio and Speech Processing) BIO220064 (Functional differentiation of auditory attention and working memory in human frontal cortex) PHY220057 (Accelerated SED Modeling of Millions of Galaxies)

5/1/22 to 7/31/22: BIO220066 (Mechanisms of somatosensory behavior) CIS210112 (Particle dynamics, COVID-19, Pedestrian dynamics) SOC220009 (Life-Cycle Student Debt and Asset Prices) CIS220057 (Semi-supervised Learning for Ecological Monitoring) BIO220086 (NAMD+AI) CIS220060 (Human-like time-awareness in deep neural network) BIO220088 (Gateways for BayesPrism (ST) and SpaceFold) BIO220090 (Interdependent Dynamics of Food, Energy and Water in Kazakhstan and Mongolia) EVE220005 (long-term variations of in-situ geophysical and geomechanical characteristics of degrading permafrost in the Arctic) CIS220066 (Testing new agent evaluation techniques on supercomputed game data) CIS220067 (Prediction of years to onset of Alzheimer's Disease) MDE220004 (Intracranial High-frequency Oscillations Identification and Analysis) CIS220069 (Unsupervised Object Detection) EAR200001 (CyberWater—An open and sustainable framework for diverse data and model integration with provenance and access to HPC) BIO220094 (Dryland plant community responses to climate change and disturbance in the western US) CIS220071 (Developing a Robust Facial Emotion Recognition System for Education) CIS220073 (Exploring the Trade-offs to Optimize the Training of Robust Neural Models) MED220018 (Advancing the quality of neuroimaging data, and the clinical utility of neuroimaging biomarkers with machine learning and open science) CIS220075 (Pattern Identification of Mental Hurdles in Introductory Computer Programming) **CIV220005** (Impacts of COVID and Extreme Weather Events on Ride Hailing)
8/1/22 to 8/31/22: CIS220077 (Active preference learning to aid public decisions)

The requested Bridges-2 resources are well suited to the development of a computational research plan for the proposed work.

To be developed using this startup.

This request is justified by progress and usage.

The renewal on Bridges-2 at the requested level is justified by progress and usage.