My Desktop
Prepare & Submit Proposals
Proposal Status
Proposal Functions
Awards & Reporting
Notifications & Requests
Project Reports
Submit Images/Videos
Award Functions
Manage Financials
Program Income Reporting
Grantee Cash Management Section Contacts
Administration
Lookup NSF ID

Preview of Award 1305190 - Annual Project Report

Cover |
Accomplishments |
Products |
Participants/Organizations |
Impacts |
Changes/Problems

Cover

Federal Agency and Organization Element to Which Report is Submitted:	4900
Federal Grant or Other Identifying Number Assigned by Agency:	1305190
Project Title:	The Neural Engineering Data Consortium: Building Community Resources to Advance Research
PD/PI Name:	Iyad Obeid, Principal Investigator Joseph Picone, Co-Principal Investigator
Recipient Organization:	Temple University
Project/Grant Period:	08/01/2013 - 07/31/2016
Reporting Period:	08/01/2014 - 07/31/2015
Submitting Official (if other than PD\PI):	Iyad Obeid Principal Investigator
Submission Date:	10/01/2015
Signature of Submitting Official (signature shall be submitted in accordance with agency specific instructions)	Iyad Obeid

Accomplishments

*** What are the major goals of the project?**

The major goal of this planning grant is to assess the need within the bioengineering community for an organization devoted to the development of big data resources. Major goals in support of this overarching goal were:

- promote the concept through presentations at major conferences and online surveys
- engage the community to assess needs
- create an advisory board to guide the development of the organization
- develop an organizational plan and estimate of the resources required
- host outreach activities to promote the need and goals of the organization

The original proposal was structured into three phases:

- create an online presence for the organization and promote it within the community
- create an advisory board (Board of Directors) and a preliminary organizational structure
- dissemination of information and collection of feedback

*** What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?**

Major Activities: The following is a list of major activities that were completed this year under the auspices of this support:

1. Full Release of the TUH-EEG Corpus

The Temple University Hospital Electroencephalogram (TUH-EEG) corpus is the first curated database to be published by the Neural Engineering Data Consortium and is the world's largest publically available EEG database. It has been published online (www.nedcdata.org) and presently contains all EEGs (in the EDF open data file format) recorded at Temple Hospital between 2004 and 2014 along with matching clinician reports (in plain text). These have been scrubbed of all identifying patient information according to NIH privacy guidelines using a combination of automated tools with manual proofing.

This is highly relevant to the mandate of the Neural Engineering Data Consortium. Our goal has been to promote the availability and use of big data resources to solve neural engineering problems. In publishing this database, we expect that the community will be able to address long standing signal processing issues with significantly improved statistical confidence owing to the unprecedented size and variabiliy inherent to the data. In doing so, the community will be making the case that more such resources should be properly curated and made public.

2. SPMB 2014 Conference

The PIs and their team hosted the 2014 IEEE Signal Processing in Medicine and Biology annual meeting at Temple University on December 13, 2014. The purpose of this meeting was to raise awareness of data and signal processing issues inherent to biomedical engineering, and to make the case for the necessity of curated big data resources. The meeting had 57 total participants, with two invited talks, 14 papers with oral presentations, and 11 posters. The NEDC agenda was emphasized through a series of discussions and panels, as well as a presentation of a paper titled "The TUH-EEG Corpus: A Big Data Resource for Automated EEG Interpretation". The conference received technical co-sponsorship from IEEE and all papers were catalogued into IEEE Xplore.

3. SPMB 2015 Conference Planning

The NEDC and Temple University will be hosting the IEEE Signal Processing in Medicine and Biology annual meeting again this year on December 12, 2015. The NEDC team (led by PI Picone) has been preparing for a larger meeting than last

year's, and is again planning to underscore the value of curated community data resources. In particular, we anticipate a demonstration of the tools and data that we have developed through NEDC with respect to the TUH-EEG corpus.

4. Public Speaking

PI Obeid made numerous public appearances to promote the NEDC's agenda of curated big biomedical data. Specifically, he gave presentations at:

- IEEE Signal Processing Society meeting (Asilomar, CA)
- Indiana University School of Medicine (Indianapolis, IN)
- IEEE Central Indiana section meeting (Indianapolis, IN)
- Annual Neuroinformatics Congress (Leiden, Netherlands)
- Applied Physics Laboratory (Laurel, MD)

5. Grant writing update

The PIs leveraged the big data resources developed through the NEDC into a number of new grant applications. Targeted federal sponsors included NSF and NIH. The following NIH grant was successfully funded:

"Automatic discovery and processing of EEG cohorts from clinical records" ($1.4M) PIs Picone, Obeid, and Harabagiu (UT-Dallas).

6. WE2 2015

As a public outreach activity, the NEDC hosted a one-day workshop for female high school engineering and math students. The students were given Emotiv wireless EEG headsets to record their own brain activations, and were challenged to write Python code to aid in the data analysis. This was the second time the NEDC has hosted this workshop, which was attended by 22 students.

Specific Objectives:

Significant Results:

Key outcomes or
Other achievements:

*** What opportunities for training and professional development has the project provided?**

We have hosted the 2014 IEEE Signal Processing in Medicine and Biology symposium and will do so again in 2015.

*** How have the results been disseminated to communities of interest?**

Conference publications and invited lectures to the engineering community. Data is available from the NEDC website.

*** What do you plan to do during the next reporting period to accomplish the goals?**

A constituents meeting will be held in FY2016 now that we have some concrete resources to discuss.

Products

Books

Book Chapters

Conference Papers and Presentations

I. Obeid, A. Harati and J. Picone (2014). *A Big-Data Approach to Automated EEG Labeling*. Proceedings of Neuroinformatics. Leiden, The Netherlands. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

I. Obeid and J. Picone (2014). *Big Data in Bioengineering*. IEEE Signal Processing in Medicine and Biology Symposium. Philadelphia, Pennsylvania, USA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

I. Obeid, A. Harati and J. Picone (2014). *EEG Event Detection Using Big Data*. Proceedings of the 48th Annual Asilomar Conference on Signals, Systems, and Computers. Pacific Grove, California, USA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Obeid I, Picone J (2014). *The Neural Engineering Data Consortium*. Proceedings of the IEEE EMBS BRAIN Grand Challenges Conference. Washington, DC. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Obeid I, Picone J (2014). *The Neural Engineering Data Consortium: Towards Big Data Resources in Bioengineering*. IEEE EnCON. Indianapolis, IN. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Harati A, Lopez S, Obeid I, Picone J, Jacobson MP, Tobochnik S (2014). *The TUH-EEG Papers Corpus: A Big Data Resource for Automated EEG Interpretation*. IEEE Signal Proc. in Med. & Biol Conf. Philadelphia, PA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Inventions

Journals

Licenses

Other Products

Databases.

The TUH-EEG corpus is a collection of over 20,000 curated electroencephalograms taken at Temple University hospital. The data are presented along with matching clinician reports that detail what the reviewing physician observed in the EEG record. The data are available online at www.nedcdata.org.

Other Publications

Patents

Technologies or Techniques

Thesis/Dissertations

Websites

Participants/Organizations

Research Experience for Undergraduates (REU) funding

Form of REU funding support:	REU supplement
How many REU applications were received during this reporting period?	5
How many REU applicants were selected and agreed to participate during this reporting period?	5
REU Comments:	none

What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Obeid, Iyad	PD/PI	2
Picone, Joseph	Co PD/PI	2

Full details of individuals who have worked on the project:

Iyad Obeid
Email: iobeid@temple.edu
Most Senior Project Role: PD/PI
Nearest Person Month Worked: 2

Contribution to the Project: Grant management, public outreach, database management, student mentoring

Funding Support: NIH Award 1 U01 HG008468-01

International Collaboration: No
International Travel: Yes, Netherlands - 0 years, 0 months, 3 days

Joseph Picone
Email: joseph.picone@gmail.com
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 2

Contribution to the Project: Grant management, public outreach, database management, student mentoring

Funding Support: NIH Award # 1 U01 HG008468-01

International Collaboration: No
International Travel: No

What other organizations have been involved as partners?
Nothing to report.

What other collaborators or contacts have been involved?
Nothing to report

Impacts

What is the impact on the development of the principal discipline(s) of the project?

Our goal, as always, has been to influence the community to see the value in the existence of a central management group (the NEDC) to handle the curation and sharing of large datasets for the neural engineering (and larger biosignal) communities. This includes more than just simple data sharing and extends to topics such as standardization of ownership and licensing agreements, as well as a communal vision for how to pool resources to create massive datasets of communal interst. Our work has continued to extend these visions, which we believe are important for changing the way data-centric engineering and development is executed, especially in academia and its industry spinoffs.

What is the impact on other disciplines?
Nothing to report.

What is the impact on the development of human resources?
Nothing to report.

What is the impact on physical resources that form infrastructure?
Nothing to report.

What is the impact on institutional resources that form infrastructure?

The presence of a large (terabyte range) data set for public sharing has necessitated an upgrade in our IT infrastructure. We have purchased a large rack-mounted server with significant storage and processing capability. Among other tasks, this server will be used to share our data online. The server is being moved to Temple's central IT.

What is the impact on information resources that form infrastructure?
Nothing to report.

What is the impact on technology transfer?
Nothing to report.

What is the impact on society beyond science and technology?
Nothing to report.

Changes/Problems

Changes in approach and reason for change
Nothing to report.

Actual or Anticipated problems or delays and actions or plans to resolve them
Nothing to report.

Changes that have a significant impact on expenditures
Nothing to report.

Significant changes in use or care of human subjects
Nothing to report.

Significant changes in use or care of vertebrate animals
Nothing to report.

Significant changes in use or care of biohazards
Nothing to report.