



CALL TO ENGAGE AND INTEGRATE SOUTH CAROLINA'S UNDERGRADUATE INSTITUTIONS IN SC EPSCoR TRACK-1 PROPOSAL:

AI-Enabled Advancement in Personalized Biomedical Devices - ADAPT in SC

BACKGROUND:

The Established Program to Stimulate Competitive Research (EPSCoR) is designed to fulfill the mandate of the National Science Foundation (NSF) to promote scientific progress nationwide. Jurisdictions are eligible to participate in the NSF EPSCoR Research Infrastructure Improvement Program (RII) based on their level of NSF research support averaged over three years. Through this program, NSF facilitates the establishment of partnerships among government, higher education, and industry that are designed to effect sustainable improvements in a jurisdiction's research infrastructure, Research and Development (R&D) capacity, and hence, its R&D competitiveness.

Research Infrastructure Improvement Track-1 (RII Track-1) awards provide up to \$20 million total over five years to support research-driven improvements to jurisdictions' physical and cyber infrastructure and human capital development in topical areas selected by the jurisdiction's EPSCoR steering committee as having the best potential to improve future R&D competitiveness. The project's research activities must align with the specific research priorities identified in the submitting jurisdiction's approved Science and Technology (S&T) Plan.

The South Carolina EPSCoR Jurisdiction will be submitting an NSF EPSCoR RII Track -1 proposal to the next program solicitation expected in August 2022. We anticipate application details to be like the 2021 solicitation ([NSF 21-586](#)). The research focus of the proposal will be artificial intelligence (AI) enabled advancement in personalized biomedical devices. This focus was identified as an area for research infrastructure expansion with significant potential for South Carolina through a competitive process involving South Carolina's three comprehensive research universities. A nationally recognized firm with scientific and technical experts familiar with NSF and the EPSCoR Program was utilized in the selection process.

This call for applications is to identify Historically Black Colleges and Universities (HBCUs) and other Predominantly Undergraduate Institutions (PUIs) in South Carolina who wish to join the proposal team and contribute to the research, academic program, and/or workforce development components of the project.

OVERVIEW:

AI-Enabled Advancement in Personalized Biomedical Devices (ADAPT) responds to the jurisdictional need to build capacity in the design of biomedical devices with AI-enabled, customized performance and secure their manufacture in South Carolina. This initiative focuses on establishing a statewide institute, the SC AI Institute for Biomedical Devices, which will harness and realize the potential in the state for integrating AI into the design of accurate diagnostic devices, smart surgical devices, and precision

rehabilitation devices. ADAPT will vitalize South Carolina's AI-enabled biomedical device industry by fostering excellence in cross-cutting STEM research; educating and training a diverse, competitive workforce; building or expanding on collaborative partnerships with academic, industrial, and healthcare institutions; developing innovative methods for translating research results to companies; and catalyzing economic development.

ELIGIBILITY:

All four-year, predominantly undergraduate institutions (PUIs) including Historically Black Colleges and Universities (HBCUs) in South Carolina

One application per institution

Application PI must be at the Dean level or higher to ensure significant institutional commitment to achieving program goals and project objectives. The PI is responsible for implementing the proposed research infrastructure improvement activities and managing all aspects of the project including reporting and engagement with the project's external evaluator.

DUE DATE:

5:00 Eastern Time on Friday November 5, 2021. Submission through the SC EPSCoR Portal

INFORMATIONAL WEBINAR:

Tuesday, October 5, 2021 3:30 to 5:00 pm. To join, visit: bit.ly/ADAPTInfoCall

ADDITIONAL INFORMATION:

Examples of research infrastructure improvement activities that are consistent with program objectives and aligned with the theme include:

- Focused faculty-student research efforts that contribute directly to the proposed theme (see attached information) and intellectual merit of ADAPT, including outcomes that result in new interinstitutional collaborations, regional and national presentations, student co-authored peer-reviewed publications, and the development and submission of research proposals establishing sustainability.
- Implementation of novel concepts for STEM research and education in ML and AI that are diverse in gender, race, and ethnicity and that will result in a strong, quantifiable impact on the diversity of the STEM workforce
- Enhancement of research and teaching productivity of junior and/or established faculty in ML and AI
- Hiring of new faculty with teaching and/or research interests in ML and AI
- Acquisition of shared, state-of-the-art research-enabling resources to support ML-AI in biomedical devices
- Development or enhancement of STEM curricula or degree program(s) to include ML-AI
- Establishment of partnerships with other entities, such as the K-12 system, national laboratories, and other South Carolina technical schools, colleges, and universities
- Pioneering multidisciplinary approaches to communicate and assess the impact of AI and personalized biomedical devices research on society

Proposed activities must include a plan for sustainability beyond the grant award. It is expected that equipment purchased with NSF EPSCoR funds will remain in the institution and will only be transferred if the Principal Investigator transfers to another institution within the state of South Carolina. If the Principal Investigator transfers out of South Carolina, the equipment must be retained within the state.

Applicants should be aware that funded activities are subject to an annual, multi-tiered review including review by a centralized External Advisory Board to address the progress of proposed activities. This board will be fully authorized to recommend expansion or reduction of proposed activities. Funded applicants will also be required to respond to all requests for information regarding program process, outputs and impacts made by the SC EPSCoR Office, including for the annual reports to be submitted to NSF.

APPLICATION REQUIREMENTS/FORMAT:

Application materials must utilize the provided forms (link to forms) and formatted for 8-1/2 x 11 inch paper, with 1-inch margins and a font size not smaller than 12 point. The application components must be submitted in PDF file format through the [SC EPSCoR Submission Portal](#). Supplemental materials such as appendices, brochures, or reprints, will not be accepted.

All applications must have the following pieces:

- Cover Page: Must use template
- Project Summary: one page maximum
- Project Description: Detailed description of the proposed research infrastructure improvement activity or activities. (4 page maximum)
- Curriculum Vitae: A biographical sketch, must follow NSF guidelines/format ([PAPPG](#)). Required for each individual identified as senior project personnel.
- Current and Pending Support: Must use template provided.
- Budget: Must use provided template.
- Budget Justification: A complete justification for all NSF funds requested. Include explanation of institutional and non-federal sources available to the project (maximum one page).

BUDGET:

An application can request a maximum of \$250,000 (direct plus indirect costs) in federal funding per year for a five-year effort. Matching funds (cash or in-kind) are not required; however, clear evidence of institutional commitment should be included in the application. Institutional commitment levels will differ among applicant institutions due to the variability of available resources. If additional resources (funds) are needed to accomplish the proposed activities, these costs should be indicated as non-federal matching funds on the budget form provided.

Each application must include one budget page (budget form provided) for each year of support plus a five-year summary budget. The estimated project costs must be shown in total as well as broken down for each year of the proposed program delineating the following cost elements:

1. **Salary Costs**: For all employees, indicate the amount of time being charged to this proposed project (i.e., number of months) and show resulting costs based on current or projected salary and fringe benefits. Salary costs for existing faculty may not exceed two summer months.
2. **Equipment**: List item and dollar amount for each item exceeding \$5,000. Costs should be based on recent quotations from manufacturers or distributors.

3. Travel Costs: Estimate the required amount of travel and state its relationship to the activities described. List the proposed destinations and basis of cost estimates. The travel budget should include costs associated with attendance of key personnel at statewide and national meetings.
4. Participant Support: direct costs for items such as stipends or subsistence allowances, travel allowances and registration fees paid to or on behalf of participants or trainees (but not employees) in connection with meetings, conferences, symposia, or training projects.
5. Supplies and Materials: Estimate the costs of supplies and materials.
6. Publication and Report Costs: Estimate the costs of publishing and reporting project outcomes.
7. Sub-award Costs: Support the estimate of sub-award work by indicating the specific items or portion of the work to be sub-awarded, type of sub-award anticipated, name of sub-awardee, and a detailed cost summary. Signed budget pages for sub-award costs must be included.
8. Consultant Costs: State the planned daily consultant fee and basis, travel expenses, the nature of the consulting effort, and the reason consultants are required to complete the effort.
9. Other Direct Costs: Itemize and justify all other direct costs. Construction costs are not allowed under this solicitation.
10. Indirect or F&A Rate: State whether a recent predetermined or provisional indirect rate has been negotiated by a federal agency and, if so, when and by which federal agency. State the basis on which the indirect rate is calculated (i.e., "salaries and wages" or "total costs").
11. Total Costs: Give the total costs, year by year, and the cost for the entire proposed project period.

SUBMISSION PROCESS:

Proposals must be submitted via the SC EPSCoR Portal at <https://scepscor.org/Solicitations/portal/index.php>. If you are not registered already, please follow the instruction to register then to upload proposal components as PDF files.

Templates for the various application components are available on the SC EPSCoR web page (<https://scepscor.org>)

REVIEW/SELECTION PROCESS:

Applications that meet the eligibility requirements and the guidelines of this solicitation will be evaluated by a team of reviewers utilizing the criteria given below. Selected applications will be further developed for inclusion in the SC EPSCoR RII Track-1 proposal to go forward to the NSF.

The evaluation criteria will include:

1. Scientific and intellectual merit of proposed refinements and/or scientific focus broadening aspects to meaningfully engage PUI faculty and students while addressing individual institutional priorities, goals and objectives. Reasonableness of alignment to the ADAPT in SC Initiative.

2. The scientific and technical merit of the proposed RII activities.
3. Broader impacts, including expanding participation of underrepresented groups in STEM research and education and demonstrating the benefits of the proposed activities to society.
4. The likelihood of the proposed effort to develop new research capabilities and to broaden the university research base in support of science and technology, and the potential to contribute to the education of future scientists and engineers in disciplines critical to the NSF mission.
5. The realism and reasonableness of proposed costs and availability of funds

CONTACT INFORMATION:

General inquiries should be made to:

Jim Doolittle
Director
SC EPSCoR Program
Jim.doolittle@scra.org

Inquiries regarding alignment with STEM research in AI, ML, and biomedical devices should be made to:

Bruce Gao
Professor, Department of Bioengineering
Clemson University
zgao@clemson.edu

Inquiries regarding STEM education and workforce development should be made to:

John Wheeler
Associate Provost for Integrative Science
Furman University
john.wheeler@furman.edu