

**C3.ai Digital
Transformation
Institute**

Second Call for Proposals

General Information Session #1

February 15, 2021

Second Call for Proposals: Digital Transformation and AI for Energy and Climate Security

AI solutions to address the challenges to Energy and Climate

Energy systems are being digitally transformed by investment at all levels of generation, transmission, and distribution.

The early lead of energy systems operators in embracing digital transformation has enabled those systems to use digital transformation not only to ***enhance energy efficiency*** but also to lead the way to a ***lower-carbon, higher-efficiency economy*** that will enhance both energy and climate security.

This Second C3.ai DTI Call for Proposals addresses the challenges for AI and Digital Transformation for Energy and Climate Security.

Second CFP: Summary

- Proposals: one year of funding (\$100K-\$250K), no indirect costs, PI must be from one of the C3.ai DTI institutions, and projects must use the C3 AI suite
- Topic: Digital Transformation and AI for Energy and Climate Security
- Funding total of \$5M
- Key dates:
 - Submission March 29, 2021 (EasyChair)
 - Decisions: late May
 - Funding start: June 1, 2021
- No prior experience with C3 AI Suite is required
- DevOps team will be available for consultation and its members can be embedded in research teams at no cost to the PIs.
- Projects that leverage other sources of funding are welcome.
- PIs and co-Investigators agree to serve as reviewers for other proposals submitted to this solicitation.

Additional Information Sessions

C3.ai DTI will host online information sessions and office hours with technical staff.

- **General Information Session (Online)**

Wednesday, February 17, 11 am – 12 pm PT / 1 – 2 PM CT / 2 – 3 pm ET

Zoom Meeting: <https://berkeley.zoom.us/j/95629876415>

- **Computing Resources Information Sessions (Online)**

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This online information session will provide an overview of the C3 AI Suite and a description of supporting resources (HPC & Cloud, training, personnel).

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- **Weekly Office Hours (Online)**

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See

<https://c3dti.ai/research/ai-for-energy-and-climate-security/>

Questions about general eligibility, proposal preparation, or research awards should be sent to proposals@c3dti.ai

Agenda

Welcome and Introductions

C3.ai DTI Vision & Overview

Second Call for Proposals: Focus and Topics

Second Call for Proposals: Computing Resources

Second Call for Proposals: Application Process

Question & Answer

C3.ai DTI

Vision & Overview

C3.ai DTI's mission is to attract the world's leading scientists to join in a coordinated and innovative effort to advance the digital transformation of business, government, and society.



C3.ai DTI Programs Overview

- 01 Research Awards**
- 02 Visiting Professors & Scientists**
- 03 Curriculum Development**
- 04 Data Analytics Platform**
- 05 Outreach Program**
- 06 Industry Partner Program**
- 07 Open Source**

01

C3.ai DTI Research Awards

Annual call for research proposals

Purpose to advance the science of digital transformation

Reviewed and awarded by university leads

26 research awards granted each year

- \$250,000 awards
- \$100,000 awards

Awards will be for 12 months in duration

Multidisciplinary and multi-institution projects will be favored

Recipients encouraged to conduct breakthrough research and to pursue and establish larger research projects with federal and other funding sources

02

C3.ai DTI Visiting Professors & Scientists

\$750,000 per year provided to each host university

Research for Digital Transformation Science

Advance design techniques and methods for:

- Physical systems and
- Societal-scale intelligent infrastructure systems

Support for up to 12 months in duration

NERF (non-exclusive royalty-free) open source IP

03

C3.ai DTI Curriculum Development

Individual awards annually for Digital Transformation Curriculum Development

Undergraduate and graduate-level curricula

- AI and IoT techniques
- Cybersecurity
- Privacy
- Ethics
- Robust machine learning

Distance learning curricula (Coursera or edX)

04

C3.ai DTI Data Analytics Platform

An elastic cloud, big data, development
and operating platform

Supporting C3.ai DTI research, curriculum development, and
classwork

Conduct research on the development of AI/ML algorithms, data
security techniques, and cyber security methodologies

C3 AI Suite Software

C3 AI Ex Machina

05

C3.ai DTI Outreach Program

C3.ai activities and events to promote Institute research and grow the community in Digital Transformation Science:

- Colloquia
- Workshops
- Research Symposia
- Website
- Newsletters
- Social Media

06

C3.ai DTI Industry Partner Program

Brings in leading companies globally to engage with C3.ai DTI researchers and activities

Industry Partners each contribute \$100,000 per year to support C3.ai DTI's operations

Industry Partners will have the opportunity to contribute anonymized data sets for research

Industry Partners will also be invited to participate in research projects, the outreach events, and short courses

07

Open Source

Research results will be published during the award period in publicly accessible repositories and more generally in the open literature

Algorithms and software to be publicly available as open source for the public good

Due to the rapidly changing about energy and climate security, researchers may be requested to provide information about their projects during the life of the award

Second Call for Proposals:

Focus and Topics

Second Call for Proposals: Digital Transformation and AI for Energy and Climate Security

AI solutions to addresses the challenges to Energy and Climate.

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Second Call for Proposals: Digital Transformation and AI for Energy and Climate Security

Areas of interest include but are not restricted to:

1. **Sustainability**: Applying AI/ML and advanced analytic techniques to support sustainability initiatives.
2. **AI for Carbon Sequestration**: Applying AI/ML techniques to increase the scale and reduce the cost of carbon sequestration.
3. **AI for Leaks and Emissions Detection**: Applying advanced AI/ML techniques for large scale emissions detection, facility-level data reconciliation and gap analysis for emissions sensors, prediction of emissions risk, and analysis and optimization of flaring intensity across upstream and downstream operations.
4. **Safe Hydrocarbon Production and Transportation Infrastructure**: Applying analytic and AI/ML modeling techniques to increase the safety and reduce emissions from oil and gas extraction, petrochemical production, and hydrocarbon transportation.
5. **AI for Advanced Energy and Carbon Markets**: Enabling dynamic, automated, and real-time pricing of energy generation sources.

Second Call for Proposals: Digital Transformation and AI for Energy and Climate Security

Areas of interest include but are not restricted to (cont.):

6. **Cybersecurity of Power and Energy Infrastructure:** Leveraging AI/ML techniques to improve the cybersecurity of critical power and energy assets, as well as smart connected factories and homes.
7. **Smart Grid Analytics:** Applying AI and other analytic approaches to improve the efficiency and effectiveness of grid transmission and distribution operations.
8. **Distributed Energy Resource Management:** Applying AI to increase the penetration and use of distributed renewables.
9. **AI for Energy-Efficient Buildings and Factories:** Leveraging AI techniques for advanced building and factory control to improve energy efficiency.
10. **AI for Improved Natural Catastrophe Risk Assessment:** Applying AI to improve modeling of natural catastrophe risks from future extreme events (e.g., tropical storms, wildfires, floods).
11. **Resilient Energy Systems:** Addressing how the use of AI/ML techniques and markets for energy and carbon introduce new vulnerabilities.

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This online information session will discuss Ex Machina, a C3 AI tool that enables anyone to develop, scale, and apply AI insights without writing code.

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Second Call for Proposals: Computing Resources



Scientific Computing

Berkeley Lab National Energy Research
Scientific Computing Center (NERSC)

- High performance facility for U.S. Department of Energy, Office of Science
- 75 million hours of computing resources on Cori (NERSC-8) and Perlmutter (NERSC-9) systems



Blue Waters

National Center for Supercomputing Applications (NCSA) at University of Illinois at Urbana-Champaign

- 110,000 node hours on Blue Waters
- 1,600,000 node hours on GPU Systems



Microsoft Azure Resources Available

\$2,000,000 per year in Microsoft Azure
compute capacity

Cloud Infrastructure to support 180 researchers

- Compute
- Storage
- All Azure services

C3.ai DTI Awardees to Use C3 AI Technologies

- Awardees will be given access to the C3 AI Suite and C3 AI Ex Machina
 - C3 AI is providing private, customizable deployments for awardees
- These platforms' features include:
 - Low- and no-code AI deployments
 - Scalable data and processing from multiple, dynamically-updated data sources
 - Schedule- and event-based processing
 - Jupyter Notebook support (Python and R)
 - Visualization dashboards

C3.ai DTI Support Available to Awardees

- DTI staff at UC Berkeley & UIUC support your use of C3 AI technology:
 - Consultations
 - Possibility of C3.ai DTI staff member joining select research teams (limited availability)
 - Customized training materials and mentoring
 - Liaison with C3 AI engineers and data scientists
- Assistance with complementary resources
 - HPC at NCSA and NERSC
 - Azure cloud

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Second Call for Proposals:

Application Process

Eligibility

- Proposal PIs must be faculty researchers from C3.ai DTI consortium partner institutions. Co-Investigators may be from C3.ai DTI consortium partner institutions or other institutions.
- Preference will be given to proposals where the majority of work and expenditures occur at C3.ai DTI consortium partner institutions.
- C3.ai DTI strongly encourages the submission of proposals that are interdisciplinary and inter-institutional across C3.ai DTI consortium partner institutions and other institutions around the world.
- NOTE: By submitting a proposal to this solicitation, **proposal PIs and co-Investigators agree to serve as reviewers** for other proposals submitted to this solicitation.

Available Funding

- It is anticipated that up to **USD \$5 million** in Research Awards will be awarded from this Call for Proposals.
- Proposals can request funding of \$100,000 to \$250,000 for an initial period of one (1) year.
- In addition to cash awards, funded proposals will include unlimited free access to the C3 AI Suite hosted on the Microsoft Azure Cloud.

Review Criteria

- Proposals must discuss how the C3 AI Suite will be used.
- Projects will be peer-reviewed on the basis of
 - Scientific Merit
 - Prior Accomplishments of the PI/ co-PIs
 - Use of AI/ML/Data Analytics/Cloud Computing
 - Suitability for Testing Methods at Scale
- No prior experience with C3 AI Suite is required; DevOps team will be available for consultation; DevOps team members can be embedded in research teams at no cost to the PIs.
- Projects that leverage other sources of funding are welcome.

Submission and Timeline

- All proposals should be submitted online via EasyChair at: <https://easychair.org/conferences/?conf=c3dticfp2>
- Use the **Proposal Submission Template** in EasyChair when preparing your proposal. When finished, save your proposal in PDF format and upload all sections to EasyChair as a single PDF.
- Proposals must be submitted to by 11:59 pm PDT March 29, 2021.
- Awards will be announced in late May 2021, with start dates of June 1, 2021.
- Questions about general eligibility, proposal preparation, or research awards should be directed to the C3.ai DTI by e-mail at proposals@c3dti.ai.

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