

Call for Proposals

Computer Science, Information Systems and Engineering Multi-disciplinary Mini- Grants 2019/2020

KENET's Mini-Grants Overview

KENET has as one of its mandates, the role of catalyzing collaboration in research and education among member universities and research institutions. KENET promotes collaboration through facilitation of Special Interest Groups (SIGs) in priority academic areas, discovery of active researchers/faculty, provision of research and education mini-grants to researchers and member institutions, as well as travel grants for faculty and/or graduate students in SIG areas.

This Call for Proposals for Computer Science/Information Systems/Engineering mini-grants is intended to promote early stage CS/IS or engineering research and development in current and emerging research areas. The mini-grants target early stage research, enabling researchers to undertake proof-of-concept work to support R&D ideas and concepts. It is envisioned that the mini-grants, which are ideally targeted at junior faculty, will position recipient researchers in good footing to further their research and expertise in emerging research areas, and subsequently attract more research funding. This call also aims at strengthening research collaboration amongst Computer Science, Information Systems and Engineering (CSISE) faculty.

Through this second round of CS/IS mini-grant funding, KENET hopes to not only support individual research teams, but to facilitate institutional collaboration and formation of communities of practice in the research areas of focus, leading to enhanced research capacity in member institutions.

Computer Science+ Information Systems + Engineering Mini- Grants: Area of Focus

The research area of focus for this round of mini-grant funding is **Internet of Things (IoT)**. In particular, the call focuses on R&D of IoT applications in the domains of Agriculture and Health, in support of government's development agenda.

Computer Science+ Information Systems + Engineering Mini- Grants: Structure, Technical Overview and Schedule

Mini-Grants Structure

1. Up to Four (4) mini-grants will be awarded for the 2019/2020 round of funding.
2. Each mini-grant will be for a maximum of KES 1.5 million
3. The grant period is 12 months.

Thematic Area of Focus: Technical Overview

Leveraging on Internet connectivity, IoT creates an interconnected network of devices – both industrial and consumer – that can talk to each other, collect and transmit data. When such connected devices are combined with automated systems, it becomes possible to develop intelligent, data-driven solutions in a myriad of application areas. Given that IoT comprises the network, the devices themselves, the data collected and transmitted, and the end-user actions deriving from the analyzed data, there are numerous opportunities for research and innovation along the IoT chain, seeking to deliver practical and cost-effective applications that can yield substantial end-user impact. However, security has been cited as one key aspect that will make or break the wide-scale adoption and use of IoT, especially in security-sensitive application areas such as health, and as such, researchers and application designers need to address the issue of IoT security effectively.

With advancement in IoT technologies, we are witnessing competing protocols, standards and technologies, each having its pros and cons from an application point of view. In addition, addressing the power and communication requirements of various types of devices, the durability of the various components in an IoT network, as well as the usability of the end product or service, is crucial in ensuring the widespread adoption and use of IoT, especially in a resource-constrained developing world context. With this call, we seek to support research that empirically evaluates these technologies and platform options with a view to deepening understanding in this area, and consequently providing guidance on the technical, viability and sustainability considerations and options, for local deployments of IoT applications in agriculture and health.

The utility of IoT applications lies in providing actionable feedback in (near) real-time with a view of enhancing efficiencies in operations. To this end, the proposed research should comprehensively address all aspects of the IoT chain from the network options, IoT devices as well as big data management and analytics, and eventual decision support, completing the information loop from data collection to actionable knowledge. Further, the research undertaken under this call should leverage KENET's shared cloud infrastructure for data management. The nature of this call envisages multi-disciplinary collaboration between engineers, computer scientists, information systems researchers as well as domain experts (health and agriculture), to ensure that all aspects of the IoT chain are comprehensively addressed.

In particular, some of the research questions that could be considered include:

1. What are the competing and locally available IoT platform options? What hardware and network architectures can effectively support the distributed computing requirements of IoT whilst taking into account the energy consumption and storage capabilities of IoT network devices? How robust and practicable are these options with respect to building scalable, cost-effective and sustainable agriculture and health R&D infrastructures?
2. What are the considerations and best practices in designing and deploying IoT architectures, methods and technologies to support big IoT data analytics and visualization in near real-time?
3. What is the nature and extent of cybersecurity vulnerabilities and threats afflicting IoT devices in use in Kenya, and what security strategies can be adopted to safeguard the integrity of deployed IoT applications in agriculture and health?
4. What business models and scaling strategies can support IoT-based solutions in the agriculture and health domains?
5. What are the legal, social and political implications and considerations of IoT as a technology option for agricultural or health research and application development in Kenya?

It is envisaged that the outputs from this area of focus will serve to open up wider adoption and integration of IoT in the local agricultural and healthcare contexts, by addressing key aspects along the IoT chain – network, devices, data management, decision-support, standards and policies, and IoT security, as well as by validating exemplar use cases in the two application domain areas.

Schedule:

Following is the mini-grant's call timeline.

Activity	Dates
Call for proposals open for submissions	18 th July 2019 to 11 th September 2019
Review and evaluation of received proposals	12 th September 2019 to 19 th September 2019
Face-to-face presentations of shortlisted applicants	23 rd September 2019
Finalists announced and mini-grants awarded	24 th September 2019
Grantees on-boarding	24 th September – 30 th September 2019
Implementation period	1 st October 2019 – 30 th September 2020
Evaluation, reporting and close-out	1 st – 15 th October 2020

CSISE Mini-Grants: Eligibility, Terms and Conditions

Eligibility

This call is open to Computer Science, Information Systems or Engineering faculty (who are full-time) at any of the KENET member institutions. Applicants must be PhD holders, must demonstrate active research interest and **must have obtained their PhD degree within the past 5 years**.

Team Composition

The lead researcher(s) must be a PhD holder meeting the eligibility criteria above. The lead researcher is at liberty to incorporate other researchers into the team as needed. If other members are incorporated into the team, then the roles and extent of involvement of these team members must be clearly spelt out. A Letter of Commitment from each Team Member with support from respective Heads of Department or Deans, must be included as part of the team's submission documents. In this letter, each organization or individual must submit in writing, their commitment to participate in project activities, specifying their exact role in the project. Teams with multidisciplinary backgrounds are encouraged. The lead researcher will serve as the team leader and the primary point of contact for the team on all matters related to implementation of the grant.

Multi-disciplinary Collaboration

Given the focus of the call on applications of IoT in Health and Agriculture, teams must endeavor to constitute multi-disciplinary teams as appropriate, incorporating domain experts in health or agriculture to work alongside the IoT researchers.

Student Involvement

One of the main objectives of this mini-grant is to develop expertise and build capacity in the areas of focus, and to grow a community of practitioners. To this end, it is important for faculty to work closely with students with a view to furthering their knowledge and capacities in the various technologies and issues of interest, in the areas of focus. Incorporating students as team members as well as designing student-level projects from the research activities to be undertaken is encouraged.

Collaboration and partnerships

To enhance research uptake and utilization, it is important for researchers to identify and seek out collaborations and partnerships with strategic persons and institutions. This not only opens up pathways for moving research from the lab to the society, but also enhances visibility of researchers and their institutions, attracting even more funding and opportunities to further their research agenda. Given the identified areas of focus, it will be imperative for teams to identify strategic partnerships and collaborations with a view to modeling and planning for prototyping, testing and scaling at later stages in the research and development cycle.

Intellectual Property

Intellectual property derived from the funded R&D activities will be appropriated and protected based on the lead researcher's institution's IP policy and procedures.

Post-Award Requirements

The successful grantees will be expected to:

1. Provide quarterly progress reports to the CSIS research associate at KENET
2. Participate and present project work at selected meet-ups organized by KENET
3. Grow a community of researchers in the area, by reaching out to other local researchers working in the area and other related multidisciplinary domains
4. Actively seek post mini-grant funding to further their research work by writing (joint) funding proposals
5. Prepare a final project report at the end of the grant period and submit to KENET. Prepare an abridged version of the project report for profiling on KENET's and institutional websites.
6. Publish paper(s) on their work in reputable journals.

CSISE Mini-Grants: Proposal Submission

Concept Note Format

1. The concept note should not exceed 6 pages (12pt, single spacing, excluding appendices)
2. The concept note should be submitted in PDF format
3. The research application area should be clearly indicated in the title page i.e. **IoT Agriculture** or **IoT Health**
4. No personal identification (names) or institutional affiliation should be included in the concept note.

Concept Note structure

The concept note should have the following structure:

1. Title
2. Problem definition and justification
3. Proposed solution and justification
4. Methodology
5. Resources (human, hardware, software etc.)
6. Work plan (not exceeding 12 months in duration)
7. Detailed Budget (not exceeding KES 1.5 million)
8. Appendices

Supporting Documents

The following documents should be included as part of the concept note submission:

1. Team profile document, indicating the names, institutional affiliation and brief biographies of the lead researcher(s). Details of other team members and any collaborating institutions should also be included in the team profile.

2. CVs of the lead researcher(s), clearly profiling research activities undertaken to date as well as relevant publications.
3. Letters of Commitment from team members and any collaborating institutions.

Concept Note submission

Concept notes with all supporting documentation should be submitted online at <https://www.kenet.or.ke/call-for-cs-eng-multi-disciplinary-mini-grants-proposals-2018-2019> by 11th September 2019, 17:00HRS EAT.

Enquiries and applicant support

All enquiries and requests for further information related to this call should be addressed to grantsadmin@kenet.or.ke.

CSISE Mini-Grants: Proposal Evaluation

1. KENET will constitute a review panel of leading Computer Science, Information Systems and Engineering experts. Members of the review panel will sign Non-Disclosure Agreements, as well as statements acknowledging that they will make no claim to the intellectual property developed by the grantees.
2. The reviewers will review all received applications as per the evaluation criteria provided in Table 2 below, and select the top 8 proposals.
3. The top eight (8) finalists will be invited for a final face-to-face presentation. During the oral presentations, the applicants will respond to and clarify any questions from the panel that will have arisen out of their written submissions. They will also be required to respond to any ad-hoc questions arising from the oral presentation.
4. After the oral presentations, the reviewers will make their final decisions on which four proposals will receive the mini-grant funding. These four (4) teams will be selected as the recipients of the 2019/2020 CSISE mini-grant funding.
5. Selected grantees will be notified formally and profiled on KENET's website.

Table 2: Evaluation Criteria

Evaluation Criteria	Evaluation Aspects	Weighted Score
Relevance and justification of proposed research topic	Is the proposed topic and preferred solution aligned with Kenya's Big 4 agenda, Vision 2030 or SDGs? Is it an important problem to solve in a developing world context? Is there sufficient research uptake and utilization potential for the proposed research outputs?	10%
Technical Approach and Methodology	Is the research concept innovative and effective compared to existing alternatives? Does it have the potential to disrupt current practices and approaches? Does it have transformative potential? Is it feasible? Is it viable? Is it sustainable? Is the proposed implementation methodology technically sound, adheres to best practice and appropriate for the local context? Has it been optimized for efficiency? Is the proposed work doable given the time and budgetary constraints of the mini-grant, considering the team's composition?	35%
Viability assessment and Scaling potential	Is Scale built into the solution? Can it be replicated in similar contexts? Is the solution viable given the operational context? Is	20%

	there scope for furthering the research idea/prototype? Is there scope for future external research funding in order to scale-up the research?	
Human capacity	Does the team have the required expertise, experience and necessary contacts to deliver?	10%
Awareness of and strategies to address/comply with policy and regulatory requirements	Does the team demonstrate sufficient actionable knowledge on the policy and regulatory environment that could impede or catapult utilization of research outputs? Have appropriate strategies to address policy or regulatory impediments been considered and/or designed?	5%
Student engagement	Are there concrete roles and responsibilities for student team members? Are there clearly defined student-level project ideas?	10%
Stakeholder buy-in	Have critical partnerships in the main domain of application been identified? Is there likelihood for collaboration during and after the grant period? Does lack of partnerships severely impede the research work during the grant period?	5%
Potential for publication in refereed journals and/or conferences	Are the results likely to be published in IEEE or equivalent journals / conferences that are indexed in Elsevier Scopus database?	5%