

Call for Proposals

Research and Innovation Grants in Computer Science and Information Systems 2023/2024

KENET's Research and Innovation 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 innovation 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 the Computer Science and Information Systems (CS/IS) Research and Innovation Grants is intended to promote early stage CS/IS research and development in current and emerging research areas, as well as strengthen the CS/IS SIG. The Research and Innovation 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 Research and Innovation grants, which are ideally targeted at junior faculty, will position recipient researchers in good footing to further their research and expertise in these areas, and subsequently attract more research funding.

Through this round of 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.

CS/IS Research and Innovation Grant: Areas of Focus

The research area of focus for this round of funding is: **Machine Learning-based Risk Prediction.**

CS/IS Research and Innovation Grant: Technical Overview, Structure and Schedule

Research and Innovation Grant Structure

1. Four (4) Research and Innovation grants will be awarded for the 2023/2024 round of funding.
2. Each Research and Innovation grant will be for a maximum of 1.5M KES.
3. The grant period is 12 months.

Area of Focus: Technical Overview

Machine Learning-based Risk Prediction

Risk management which entails identifying, assessing and controlling risks or threats that can impede attainment of desired objectives, is a critical management practice for any organization that seeks to improve the likelihood of success. Risk prediction, which establishes the probability that a risk event might occur and the potential outcome associated with each event, is a critical step in risk management. Risk prediction enables the identification and monitoring of emerging risks before they can have a significant undesirable impact on the objectives that the organization seeks

to attain. When such models are augmented with reporting alerts in near real-time, they can readily feed into an early warning system that the organization can utilize to prepare and act appropriately, and in sufficient time, to reduce the possibility of harm or loss.

With this call, we seek proposals that address the need for the design and development of innovative predictive risk management solutions in socio-economic domains that have significant importance locally and regionally, and where unwanted situations hamper economic and social development. We are interested in solutions to risk management and early warning that accumulate and aggregate internal and external risk information and which leverage machine learning techniques, generate risk alerts in near real-time to enable organizations stay ahead of current risks and improve how they manage and respond to emerging risks. We seek end-to-end predictive risk management solutions that address (i) the identification and near real-time collection of appropriate risk information for the domain/problem of interest, (ii) machine learning based risk analysis, assessment and monitoring, and (iii) eventual feedback of risk prediction to decision-makers to inform timely interventions with the sole purpose of avoiding and/or reducing negative outcomes associated with the predicted risks.

The proposed solutions should have the potential to be implemented at scale to report on identified risk(s) and support timely interventions to avert socio-economic crises. Further, we are particularly interested in proposals that employ IoT methods in the collection of risk data where possible, and proposals that could utilize KENET's research cloud for the data management component.

Domains of focus

Whereas risk prediction and early warning have applicability in a wide range of socio-economic domains, with this call, we are interested in the application of machine-learning based risk prediction in line with the following SDG priority areas¹:

1. **Education** e.g. predicting learner performance or flagging at-risk students who are likely to drop out.
2. **Health** e.g. predicting and addressing clinical deterioration of patients, predicting infectious disease outbreaks or predicting malnutrition amongst children.
3. **Agriculture** e.g. supporting climate change adaptation, monitoring and alerting on agri-food risks or supporting agro-based livelihood resilience.
4. **Finance** e.g. predicting banking and currency crises, predicting credit risk, bankruptcy and insolvency prediction in the insurance sector and so on.

¹ Note that the examples given are merely to highlight interesting use cases with potential for application of predictive risk management and applicants are in no way restricted to these use cases.

CS/IS Research and Innovation Grant: Eligibility, Terms and Conditions

Eligibility

This call is open to computer science or information systems faculty (who are full-time) at any of the KENET member institutions. Applicants must be PhD holders, having received their PhD within the past 10 years, and must demonstrate active research interest.

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.

Student Involvement

One of the main objectives of this research and innovation 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 area of focus. Incorporating students, and especially PhD 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 area 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 cycle. In particular, teams that will collaborate with partners who have already established IoT networks and other mechanisms for real-time data collection will be at an advantage as they will already have addressed the big data aspect for the proposed solution. Proposals relying on KENET's research cloud infrastructure will also be preferred as this will reduce their hardware costs.

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 CS 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 research and innovation 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.

CS/IS Research and Innovation Grant: 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 domain in which the research area is focused should be clearly indicated in the title page e.g. Agriculture, Health, Education, Finance etc.
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 1.5M KES); **Only up to 40% of the total budget should be set aside for purchase of PCs, laptops. The use of the KENET cloud services is strongly encouraged,**
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 sent via email to csisgrants@kenet.or.ke by 14th July 2023, 5.00PM EAT.

Enquiries and applicant support

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

CS/IS Research and Innovation Grant: Proposal Evaluation

1. KENET will constitute a review panel of leading CS/IS 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 6 proposals.
3. These top six (6) 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 three proposals will receive the CS/IS Research and Innovation Grant. Three (3) teams will be selected.
5. Selected grantees will be notified formally and profiled on KENET’s website.

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 Research and Innovation 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 there scope for furthering the research idea/prototype? Is there scope for future external research funding in order to scale-up the research?	15%
Human capacity	Does the team have the required expertise, experience and necessary contacts to deliver? Do they have a local footprint?	15%
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%

Table 1: Evaluation Criteria