

**NATIONAL RESEARCH PROGRAM FOR UNIVERSITIES (NRPU) PROPOSAL COVER SHEET**

| **Title of Project:** | Enhancing Airport Security Management through Real-time Computer Vision: An AI-Powered Anomaly Detection System |
| --- | --- |
| **Duration of Project:** | 12 months |
| **Total Budget Requested** | 625,600 PKR |
| **Theme of Proposed Research** | Applied |
| **Discipline of Proposed Research** | 1. Agriculture Sciences  2. Arts & Humanities  3. Biological and Health Sciences  4. Management Sciences 5. Education and Human Resources  6. Engineering and Technology 7. Mathematical and Physical Sciences  8. Social, Behavioral and Economical Sciences  |
| **Major Field** | Computer Science |
| **Minor Field** | Artificial Intelligence and Engineering |

| **To which priority area of national relevance does**  **the proposal respond?** | National security and Public safety. |
| --- | --- |

| **Institution Name** | Iqra University |
| --- | --- |
| **Institutional Address** | Gulshan E Amna Faisal Cantonment, Karachi, Sindh |
| Karachi |
| **Principal Investigator** | Engr. Ghalib Nadeem |
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1. **EXECUTIVE SUMMARY**

This proposal describes a research project to improve airport security management through an artificial intelligence-based computer vision and real-time anomaly detection system. The project addresses national security issues by developing advanced surveillance technology to detect and respond to unusual activity, to ensure airport operations and security. A key question is how computer vision and real-time artificial intelligence can be used to improve airport security through anomaly detection. Current airport security systems rely on traditional manual monitoring and control methods which are prone to human error and inefficiency. The proposed project will overcome these challenges by using artificial intelligence and computer vision to automate threat detection and improve accuracy.

To achieve this the project will perform the following activities: data collection and preprocessing, model training, integration and testing, optimization, implementation and deployment. These activities will include training a robust AI model to detect anomalies in real time, integrating this model with existing video surveillance infrastructure and creating simulated airport scenarios for testing and validation while ensuring privacy and security regulations. The Principal Investigator, an engineer specializing in electrical and electronics engineering, will lead the project focusing on model training and overall project management. Co-principal investigator, an expert in elastic optical networks, will provide expertise on integrating network components and optimizing data transmission. University partners will provide technical expertise and support testing and explore possible future partnerships with authorities and security agencies to implement results and provide concrete solutions.

The project has national importance and falls under the priority areas of security and technology. Improving airport security with AI based anomaly detection not only increases security but also streamlines operations, reduces delays and improves passenger experience. This technological development can make Pakistan a leader in providing innovative security solutions and attract international cooperation and investment. Moreover, the project will boost the local economy by creating jobs in the technology and scientific sectors.

1. **PRIORITY AREA OF NATIONAL RELEVANCE, AND IMPACT OF PROPOSED NRPU PROJECT ON THE PRIORITY AREA**

The proposed project focuses on important national priorities in the fields of public safety and security, particularly air travel. As dangers to public framework develop, the requirement for cutting edge specialized solutions for further development, safety efforts have never been more critical.

**National Importance:**

Airport security is a significant piece of public safety. Due to its widespread influence and high visibility, malicious actors frequently target the airline industry. Human error and inefficiency are common problems with manual controls in traditional security systems. There may be vulnerabilities that can be exploited because these systems may not detect threats in real time. This project proposes an ongoing AI based anomaly detection system that utilizes real time computer vision to address these basic gaps.

**Research participation:**

The research exercises of this project will fundamentally propel the information on artificial intelligence and security innovation. The project's objective is to create a computer vision-based anomaly detection system that can spot suspicious activity in real time. In addition to advancing the field of artificial intelligence, it offers a practical way to enhance airport security measures. The combination of artificial intelligence into security frameworks is a critical jump that pushes the limits of flow examination and sets new guidelines for future innovations.

**Timeliness and Relevance:**

The significance of this exploration is highlighted by the ascent and improvement of safety dangers. After the pandemic, global tourism resumed, posing greater threats to aviation security. This project comes at the right time and addresses the immediate need to enhance security measures. By offering a novel and functional arrangement, the review fills a basic hole in current data security rehearses.

**National Context and Socio-Economic Impacts**:

In the national context, this project fulfills Pakistan's goals of modernizing infrastructure and adopting innovative technologies to improve public safety. The development of this AI-based system is in line with global trends in automation and smart security solutions. The project not only safeguards citizens but also boosts confidence in the nation's aviation sector by enhancing airport security. The expansion of the economy is aided by an increase in international investment and travel.

The project's successful completion demonstrates Pakistan's commitment to utilizing cutting-edge technology to address pressing national issues. It will also contribute to the local economy by creating jobs in the technology and science industries. This attracts international cooperation and investment and establishes the nation as a leader in artificial intelligence-based information security solutions. The project's outcomes have broad repercussions that have the potential to influence safety procedures in other fields, such as public transportation and large-scale public events.

1. **ACADEMIC COLLABORATORS**

**Principal Investigator (PI) and Co-PIs:**

* **PI**: Engr. Ghalib Nadeem
* **Role**: Project leadership and oversight
* **Skills**: Expertise in electrical and electronic engineering, specialized knowledge in AI, computer vision, and anomaly detection.
* **Responsibilities**: Lead the project, oversee AI model training

* **Co-PI:** Dr. Irfan Anis
* **Role**: Technical advisor
* **Skills**: Expertise in elastic optical networks
* **Responsibilities**: provide expertise on integrating network components and optimizing data transmission, support model training, data analysis, system security, and provide technical expertise

**Collaboration Details:**

* **Type**: Collaboration
* **Institutions Involved**: Iqra University
* **Sustainability**: Weekly meetings, shared resources, and long-term research plans

**Role and Contributions**

* **Disciplinary Expertise**: Each collaborator brings specialized knowledge in their field
* **Experimental Equipment**: Access to camera and computing facilities
* **Technical Expertise**: Combined expertise to tackle project challenges

**Additional Resources**

* **Research Grants**: Existing grants from educational and technology funding bodies
* **Support**: Institutional support for research activities and infrastructure

| Academic Collaborators | |
| --- | --- |
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1. **PROJECT DESCRIPTION**

**Problem Statement:**

The primary concern of this project is enhancing airport security by implementing a real time anomaly detection system. Existing security measures often face challenges in spotting potential risks leaving openings for exploitation. The suggested solution involves using computer vision enabled by artificial intelligence to identify anomalies like unattended objects, unauthorized individuals, environmental hazards and fluctuations in light levels. Current systems typically rely on surveillance methods that may not effectively handle the complexities of threats or seamlessly integrate with real time data processing technologies.

**Literature Review and Gaps:**

In terms of literature review and gaps, recent advancements in artificial intelligence and computer vision have demonstrated benefits for enhancing security systems across various domains although their application in airport security remains largely unexplored. Studies have highlighted the Convolutional Neural Networks (CNNs) in detecting anomalies within controlled settings; however, there is a lack of research on incorporating these models into existing airport security frameworks.

**Contribution to Knowledge:**

This project will contribute new insights into the practical application of AI-driven anomaly detection in dynamic, real-world environments. By addressing specific security challenges faced by airports and offering a solution that combines cutting-edge technology with operational needs, the research will extend the current understanding of how AI can be utilized for enhancing public safety in critical infrastructure settings.

**Beneficiaries:**

The primary beneficiaries of this project will be the aviation industry in Pakistan, including airport authorities and security agencies. The improved security system will enhance the efficiency and effectiveness of airport operations, contribute to passenger safety, and provide a model that can be adapted for other high-security environments.

**Methodology:** The research plan is encompassing the following key milestones:

* Data Collection: Gather data for various anomalies.
* AI Model training: Design and train the initial AI models.
* Preliminary Testing: Conduct initial tests to evaluate model performance.
* Validation: Perform rigorous testing in real-world scenarios.
* Refinement: Improve model accuracy based on feedback.
* System Integration: Integrate the AI models with existing security systems.
* Deployment: Implement the system in a simulated environment.
* Performance Evaluation: Assess the system's impact on security protocols.

The milestones of the project along with their deliverables are as follows:

**Month 1-2: Project Initialization and Data Collection**

**Milestones:**

- Project kick-off meeting with all stakeholders

- Finalize project plan and timelines

- Establish project infrastructure and procurement of necessary resources

- Begin data collection

**Deliverables:**

- Detailed project plan and timeline

- Initial dataset for training the AI model

**Month 3-4: Data Preprocessing and Initial Model Training**

**Milestones:**

- Complete data preprocessing, including cleaning and annotation

- Train initial version of the AI model for anomaly detection

- Conduct preliminary tests to evaluate model performance

**Deliverables:**

- Preprocessed and annotated dataset

- Initial AI model

- Preliminary test results and performance report

**Month 5-6: Model Training and Optimization**

**Milestones:**

- Train the AI model using the preprocessed dataset

- Optimize model parameters to improve accuracy and reduce false positives

- Conduct comprehensive testing to validate model performance

**Deliverables:**

- Trained and optimized AI model

- Comprehensive test results and performance metrics

- Documentation of model training and optimization process

**Month 7-8: System Integration and Testing**

**Milestones:**

- Integrate the AI model with existing airport surveillance systems

- Develop a user interface for real-time anomaly detection alerts

- Conduct integration tests to ensure system compatibility

**Deliverables:**

- Integrated AI anomaly detection system

- User interface for real-time alerts

- Integration test results and system compatibility report

**Month 9-10: Simulation and Validation**

**Milestones:**

- Create simulated airport scenarios to test the system

- Validate the system's performance in detecting anomalies in simulated environments

- Collect feedback from stakeholders and make necessary adjustments

**Deliverables:**

- Simulated airport scenarios and test results

- Validation report on system performance

- Stakeholder feedback and system adjustment report

**Month 11: Final Testing and Deployment Preparation**

**Milestones:**

- Conduct final round of testing in real-world airport settings

- Finalize system documentation, including user manuals and technical guides

- Prepare for deployment and training of airport security personnel

**Deliverables:**

- Final test results in real-world settings

- Comprehensive system documentation

- Training materials for airport security personnel

**Month 12: Deployment and Project Closure**

**Milestones:**

- Deploy the AI-powered anomaly detection system at the target airport

- Conduct training sessions for airport security personnel

- Hold project closure meeting and present final project report

**Deliverables:**

- Deployed anomaly detection system

- Trained airport security personnel

- Final project report and presentation

**Project Team and Partnerships**

**Capacity:**

Our team for this project consists of a lecturer specializing in AI, computer vision and database management along with instructors who bring their expertise in project management and implementation.

**Facilities:**

We will be using state-of-the-art labs equipped with all the tools needed for AI training.

**Plans for Dissemination**

**Data Collection and Curation:**

When it comes to data collection we are committed to curating and anonymizing the data to ensure privacy and security. This collected data will be used for training AI models. The insights gained will be documented in reports.

**Dissemination Channels:**

Research results will be disseminated through:

- Publications in international, peer-reviewed journals

- Formal reports shared with airport authorities, policymakers, and security agencies

**Formal Mechanisms:**

- Reports and briefings to stakeholders

- Policy briefs to inform security strategy and decision-making

**Ethical Considerations**

**Privacy and Confidentiality:**

Privacy concerns related to surveillance data will be addressed by ensuring all data is anonymized and securely stored. Informed consent will be obtained from all participants where applicable, and measures will be implemented to protect individual identities.

1. **PROJECT MANAGEMENT**

**Project Management Structure**

**Principal Investigator (PI):**

* **Responsibilities:** Oversees overall project management, including coordination, budgeting, scheduling, and ensuring project objectives are met. Acts as the primary liaison with funding agencies and stakeholders.
* **Role:** Strategic decision-making and overall project coordination.

**Co-Principal Investigator (Co-PI):**

* **Responsibilities:** Supports the PI in specific areas such as data collection, AI model training, and system integration. Ensures detailed execution of these components.
* **Role:** Manages key project components and oversees specific tasks.

**Project Team Members:**

* **Roles:** Includes research assistants, technical staff, and industry collaborators. Contribute to data annotation, AI model training, system testing, and user training.

**Motivating and Incentivizing Collaborators:**

To motivate and ensure commitment from collaborators:

* **Weekly Meetings and Progress Reviews:** Weekly meetings to review progress, address challenges, and align efforts.
* **Recognition of Contributions:** Formal acknowledgment of individual and team achievements in reports and presentations.

**Communication of Challenges and Research Results:**

* **Weekly Reports:** Document achievements, challenges, and next steps. Discussed in meetings for transparency and collaborative problem-solving.
* **Weekly Meetings:** Weekly discussions on emerging challenges and strategic adjustments.

**Support from University Leadership:**

**Dean’s Role:**

* **Institutional Support:** Access to necessary research facilities, including laboratories and computing resources.
* **Administrative Backing**: Support for coordination with university departments and handling logistical aspects.
* **Funding Support:** Potential additional funding for unforeseen expenses or extended project activities.

1. **IMPLEMENTATION TIMELINE**

The Implementation Timeline below provides a high-level overview of the planned research activities for the proposed AI-powered anomaly detection system, outlining key milestones, deliverables, and a Gantt Chart to ensure timely progress.

**Gantt Chart:**

| **Month** | **Task** |
| --- | --- |
| 1-2 | Project Initialization and Data Collection |
| 3-4 | Data Preprocessing and Initial Model Training |
| 5-6 | Model Training and Optimization |
| 7-8 | System Integration and Testing |
| 9-10 | Simulation and Validation |
| 11 | Final Testing and Deployment Preparation |
| 12 | Deployment and Project Closure |

**Narrative:**

**Month 1-2: Project Initialization and Data Collection**

**Milestones:**

  - Project kick-off meeting with all stakeholders

  - Finalize project plan and timelines

  - Establish project infrastructure and procure necessary resources

  - Begin data collection

**Deliverables:**

  - Detailed project plan and timeline

  - Initial dataset for training the AI model

**Month 3-4: Data Preprocessing and Initial Model Training**

**Milestones:**

  - Complete data preprocessing, including cleaning and annotation

  - Train initial version of the AI model for anomaly detection

  - Conduct preliminary tests to evaluate model performance

**Deliverables:**

  - Preprocessed and annotated dataset

  - Initial AI model

  - Preliminary test results and performance report

**Month 5-6: Model Training and Optimization**

**Milestones:**

  - Train the AI model using the preprocessed dataset

  - Optimize model parameters to improve accuracy and reduce false positives

  - Conduct comprehensive testing to validate model performance

**Deliverables:**

  - Trained and optimized AI model

  - Comprehensive test results and performance metrics

  - Documentation of model training and optimization process

**Month 7-8: System Integration and Testing**

**Milestones:**

  - Integrate the AI model with existing airport surveillance systems

  - Develop a user interface for real-time anomaly detection alerts

  - Conduct integration tests to ensure system compatibility

**Deliverables:**

  - Integrated AI anomaly detection system

  - User interface for real-time alerts

  - Integration test results and system compatibility report

**Month 9-10: Simulation and Validation**

**Milestones:**

  - Create simulated airport scenarios to test the system

  - Validate the system's performance in detecting anomalies in simulated environments

  - Collect feedback from stakeholders and make necessary adjustments

**Deliverables:**

  - Simulated airport scenarios and test results

  - Validation report on system performance

  - Stakeholder feedback and system adjustment report

**Month 11: Final Testing and Deployment Preparation**

**Milestones:**

  - Conduct final round of testing in real-world airport settings

  - Finalize system documentation, including user manuals and technical guides

  - Prepare for deployment and training of airport security personnel

**Deliverables:**

  - Final test results in real-world settings

  - Comprehensive system documentation

  - Training materials for airport security personnel

**Month 12: Deployment and Project Closure**

**Milestones:**

  - Deploy the AI-powered anomaly detection system at the target airport

  - Conduct training sessions for airport security personnel

  - Hold project closure meeting and present final project report

**Deliverables:**

  - Deployed anomaly detection system

  - Trained airport security personnel

  - Final project report and presentation

**Major Tasks and Deliverables:**

| **Major Task** | **Deliverable** |
| --- | --- |
| Project Initialization and Data Collection | Detailed project plan, initial dataset |
| Data Preprocessing and Initial Model Training | Preprocessed dataset, initial AI model |
| Model Training and Optimization | Trained AI model, comprehensive test results |
| System Integration and Testing | Integrated system, user interface |
| Simulation and Validation | Simulated scenarios, validation report |

1. **PHYSICAL RESOURCES AND FACILITIES**

The proposed project's success depends on the availability and efficient use of facilities and resources. The resources and facilities that will support the AI-powered anomaly detection system for airport security's work plan are outlined in detail below. Also included are major anticipated equipment expenditures, cost estimates, and maintenance plans.

**Available resources:**

**1. Computer labs:**

* **Description:** The project uses advanced university computer labs equipped with powerful computers and necessary programming tools for deep learning model development and training.
* **Contribution to Work Plan:** These laboratories facilitate the training and testing of AI algorithms, ensuring the reliability and efficiency of the models.

**2. CCTV Infrastructure:**

* **Description:** Various CCTV cameras will be installed to simulate different areas of the airport such as check-in counters, security checkpoints and flight gates. This creates a realistic environment for testing the anomaly detection system.
* **Contribution to Work Plan:** CCTV infrastructure is critical to enable real-time anomaly detection and provides the necessary data to train and validate AI models.

**Major cost of equipment.**

**1. High-resolution CCTV cameras:**

* **Purpose:** to record detailed surveillance footage from various locations of the airport, ensuring high-quality data for anomaly detection.
* **Estimated price:** PKR 55,000 per unit
* **Quantity:** 2 units
* **Total cost:** PKR 110,000

**2. GPU units:**

* **Purpose:** Accelerated AI model training and real-time anomaly detection using the computing power required for deep learning processes.
* **Estimated price:** PKR 200,000 per unit
* **Quantity:** 1 unit
* **Total Cost:** PKR 200,000

**Maintenance Plan**

**During the Project:**

* **Routine Inspections:** Includes CCTV cameras, GPU equipment and network infrastructure to ensure proper operation.
* **Software Updates:** AI models and related software are periodically updated to include improvements and new features.

**After the project:**

* **Handover to the IT department of the airport:** After the end of the project financing, the maintenance of the installed equipment will be transferred to the IT department of the airport
* **Long-term support:** The project team trains the airport's IT staff to ensure they are equipped to handle potential technical issues.

**Adding rooms to the work plan**

**1. Computer labs:**

* **Role:** Computer labs are the main place to train and test AI algorithms. Available high-performance computing resources enable efficient model training and validation.

**2. CCTV Infrastructure:**

* **Role:** CCTV infrastructure plays an important role in real-time anomaly detection by providing AI models with continuous surveillance footage for analysis. This helps to test and improve the system in a controlled but realistic environment.

Using these physical resources and facilities, the proposed project is well equipped to achieve its goals. Detailed planning of equipment costs and maintenance ensures the sustainability and efficiency of the project both during and after its implementation.

1. **PROJECT WEAKNESSES AT LAUNCH**

The project is designed to tackle significant issues in airport security through the development of an AI-powered anomaly detection system. However, certain capacity gaps and challenges exist at the launch of the project. Addressing these weaknesses is crucial for the successful implementation and achievement of project goals.

**1. Limited Initial Data for Training**

**Strategy:** Collaborate with other institutions and airports to access comprehensive datasets. Conduct pilot studies to gather initial data, ensuring a robust and diverse dataset for training the AI models.

**2. Integration Challenges with Mock Airport Systems**

**Strategy:** Form a dedicated integration team to ensure seamless integration and testing of the AI system. This team will focus on compatibility with simulated airport surveillance systems and address any integration issues promptly.

**3. High Initial Setup Costs**

**Strategy:** Pursue additional funding opportunities or grants to offset initial setup costs. Prioritize essential equipment acquisitions critical to the project's success, such as high-resolution CCTV cameras and GPU units for model training.

**4. Potential Privacy Concerns**

**Strategy:** Develop robust privacy policies tailored to the project’s requirements. Secure informed consent from participants involved in mock airport scenarios and implement stringent data security measures to protect privacy and ensure ethical compliance.

**5. Technical Skill Gaps in Team**

**Strategy:** Organize targeted training sessions and workshops focusing on enhancing the team’s expertise in AI model training, system integration, and database management. This will ensure the team is well-equipped to handle the specific challenges of airport security applications.

1. **RISK MANAGEMENT STRATEGY**

Effective risk management is critical to the success of a project. This section describes potential risks, mitigation strategies and processes to deal with unexpected risks that may arise during the life of the project.

**Potential Risks and Mitigation Strategies**

**1. Technical Challenges in AI Training**

* **Strategy:** Conduct extensive testing and validation phases to identify and resolve technical issues early in the project. The use of agile development methods and continuous integration practices ensure a rapid response to technical challenges.

**2. Collaboration and Communication Problems**

* **Strategy:** Establish clear communication protocols and weekly meeting schedules to ensure effective collaboration among all team members. Use collaboration tools like teams, zoom and video conferencing platforms to facilitate seamless communication.

**3. High initial setup costs**

* **Strategy:** Secure additional funding and grants to reduce high initial setup costs. Prioritize the acquisition of equipment such as high-resolution CCTV cameras and GPU equipment for the success of the project.

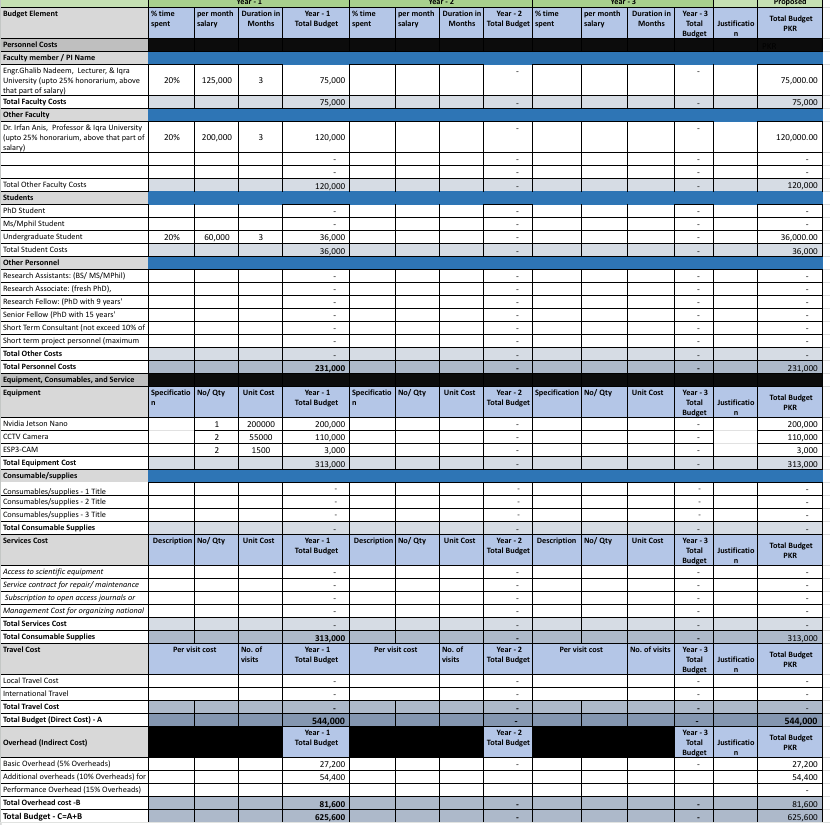
**Unanticipated Risks and Mitigation Strategies**

**Strategy to Identify and Address Unanticipated Risks**

* **Continuous Risk Assessment and Monitoring:** Implement a continuous risk assessment framework to monitor and assess risks during the project. This requires regular risk assessment meetings and updating risk management plans when necessary.
* **Flexible Project Management Approach:** Adopt a flexible project management approach to adapt to emerging challenges. Agile methods allow the team to quickly react to unexpected risks and change project plans accordingly.
* **Collaboration with Institutional Management and Stakeholders:** Communicate regularly with institutional management and stakeholders to discuss potential risks and mitigation strategies. Their understanding and support are crucial in the face of unforeseen challenges.

The Principal Investigator (PI) works closely with institutional leadership and partners to implement these strategies. Regular progress reports, risk assessment sessions and stakeholder meetings are held to ensure early identification and effective management of risks.

1. **PROPOSED PROJECT BUDGET**



1. **REQUIRED ATTACHMENTS**

1. Letter of Support (maximum two pages) from the University Head (Vice-Chancellor/ Rector). The letter should: confirm the institutional commitment to the proposed project.
2. Letter of Support from Head of the Collaborating Institutions. The letter should: confirm the institutional commitment to the proposed project.
3. Affidavit for time commitment and honorarium of PI and Co-PIs by the respective Head of the (University (VC/ Rector) and the collaborating Institutions/ organizations)
4. Appointment letter from the PI & Co-PIs to confirm their affiliation with Universities and collaborating Institutions
5. Last pay slip of Pakistani PI and Co-PIs for finalizing the personnel cost in Budget
6. Letters of Commitment (maximum two pages each)

* From local or sectoral collaborators (maximum 3 letters).
* From academic collaborators (maximum 3 letters)
* The letters should describe how the collaborator will contribute to the proposed project goals. The letter should also describe how the collaborator will support their costs associated with participating in the project.

1. Ethical Certificate duly signed by Ethical Research Committee of Institute
2. Signed and dated Curriculum Vitae of the following individuals:

* Principal Investigator and CoPIs
* Up to five additional academic, local or sectoral collaborators who will contribute to the proposed project
* The CVs should be of a standard form (maximum two pages) and include the following; information:
* Full Name
* Position/Title
* Institution
* Professional Training/Education
* Chronological List of Positions
* List of up to five publications related to the proposed project, in standard citation format
* List of up to five activities related to the proposed project. These activities may include: current or previous grants; teaching; collaborations; leading workshops/conferences; community outreach or engagement; consulting; etc.

| **Declaration Certificate:**  It is hereby certified that:   1. PI is a full time regular faculty member of HEI or if is hired on contract, same is not less than project life/duration. 2. The university will spare the faculty members from any teaching or administrative responsibilities against their time committed on the proposed project. 3. Equipment(s) demanded for the proposed project is / are not available in the University   / Institute.   1. No portion of the proposed project has been submitted and /or funded by HEC or any other funding agency. 2. The proposed project is genuinely novel and that there is no plagiarized material including self-plagiarism. 3. PI has never been blacklisted by HEC. 4. PI is not executing any other project of HEC which is delayed. 5. Decision of HEC will be considered final and will not be challenged in a court of law. 6. The University/DAI will provide complete support and facilitation to the PI and his project team for the establishment & operation of the proposed project, if approved by HEC and funds awarded to the University/ DAI. Accordingly, the University/ DAI will provide necessary facilities for smooth execution of the project including land, building, space, laboratories, machinery, equipment, transport, amenities like utilities and other services. 7. The University/DAI will get clearance from HEC (Project Completion Certificate /Project Clearance Certificate (PCC)) in order to relieve the PI, for any reason e.g. for postdoc leave/EOL/study leave/ termination of job etc, if the proposed project is awarded by HEC. 8. The University/DAI will not replace the PI of the proposed project without getting prior permission from HEC in writing. | |
| --- | --- |
| **Signature of Principal Investigator**  Name: Designation: Department:  University/ DAI Name | **Signature with Stamp of Director (ORIC/Research Office)**  Name: Designation:  University/DAI Name |
| **Signature with Stamp of the Head of University/ DAI**  (Vice-chancellor/Rector)  Name:  University/ DAI Name: | |