ORIC IMSCIENCES RESEARCH Faculty GRANT PROGRAM

APPLICATION FORM

COVER SHEET FOR PROPOSAL

*Please Note: The total cost for the project should not exceed RS. 0.5 million*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. TITLE OF PROPOSED PROJECT  **Vehicle Smart Tracking using GPS and GSM.** | | | | | | |
| B. WHETHER PROPOSED RESEARCH IS BASIC ⬜ OR **APPLIED ☑** | | | | | | |
| C1. RESEARCH DOMAIN  ⬜ Social Sciences ⬜ Arts ⬜ Humanities **☑ Computer Engineering**  C2. STATE FIELD OF RESEARCH AND SPECIALIZATION  (For example; Major: Economics, Anthropology, Specialization: Micro-Economics, Social Anthropology)  Major **Computer Engineering** Specialization **Embedded Systems** | | | | | | |
| D. PROJECT DIGEST. Describe the proposed research using (about 250) words geared to the non-specialist reader.  It’s hard to keep track of your vehicle as well as its usage together. In market there are lots of solutions available for tracking down a vehicle but there is no such thing to track its usage. The tracking of the vehicle along with its usage gives the owner a peace of mind and also restricts the user to restrain the usage within the permitted limits.  The research work will be based on designing and implementing such system that will be able to track the vehicle along with its usage. Tracking vehicle refers to keeping record of vehicle present location while tracking vehicle usage refers to keeping record of vehicle speed, RPM value, fuel level and engine temperature .  This proposed design will be available for further research and enhancement for the students of Institute of Management Sciences and external researchers. It will help us to interact with the other institutes and researchers all around the globe. Initiative in this domain can considerably increase the citation index of our institute that also helps in national and international grading of the Institute of Management Sciences. | | | | | | |
| E1. PRINCIPAL INVESTIGATOR NAME (full with no initials)  **Dr. Awais Adnan** | | | | E2. HIGHEST DEGREE  **Ph.d** | | E3. POSITION/TITLE  **Assistant Professor** |
| E4. DEPARTMENT/SECTION  **Computer Science** | E5. UNIVERSITY/INSTITUTION  **Institute of Management Sciences** | | | E6. MAILING ADDRESS  **1-A, Sector E-5, Phase 7, Hayatabad, Peshawar** | | |
| E7. Telephone: Fax: Cell: Email: **awais.adnan@imsciences.edu.pk**  (Area code, number and extension) (Area code, number) | | | | | | |
| F: CO-PRINCIPAL INVESTIGATOR NAME  **Mr. Omar Bin Samin** | | | | | | |
| G1. PROPOSED DURATION OF PROJECT:  **6 months** | | G2. PROPOSED STARTING DATE  **1st March, 2016** | | | H. TOTAL FUNDS REQUESTED **196,000 PKR** | |
| **CERTIFICATES**   1. **Certified that the equipment(s) demanded for the subject project is/are not available in the University / Institute**. 2. **Certified that the project under reference has not been submitted to any other funding agency including HEC.**      1. **Certified that No portion of the project has been funded by any other funding agency including HEC in the past.**     SIGNATURE OF PRINCIPAL INVESTIGATOR SIGNATURE THE HEAD OF INSTITUTION  (Vice-chancellor/Rector of University, Director of Degree-  awarding Institutions) | | | | | | |
| SIGNATURE OF PRINCIPAL INVESTIGATOR  Date:  SINATURE OF CO-PRINCIPAL INVESTIGATOR  Date: | | | ENDOSEMENT OF THE HEAD OF INSTITUTION (Vice-chancellor/Rector of University, Director of Degree-awarding Institutions)  Signature & Date  Name: Title:  Address:  Phone FAX E-mail | | | |

# Project DEtails

# 1. PROJECT SUMMARY

|  |
| --- |
| Describe the proposed research using (about 250) words.  Vehicle usage monitoring is a new area of research in the field of vehicle tracking. It is important because of its potential application in areas like surveillance, time estimation system, etc.  This project will be designed in two different flavors:   1. **Gold**  * Vehicle usage stats will be sent to user via SMS * Vehicle present location (longitude and latitude) will also be sent via SMS      1. **Platinum**  * Vehicle usage stats will be uploaded to web server via 3G * Vehicle present location (longitude and latitude) will also be uploaded to web server via 3G * Exact location of the vehicle will be marked in the map (android application) * All the vehicle usage stats will be displayed in the android application   The main objective of this project is to monitor the vehicle usage stats. As no major work is done in this regard before, we can take this as an advantage and design such system and make it publically available under the Institute of Management Sciences domain to everyone for research. This project will provide the backbone for any future research on vehicle usage monitoring. |

# 2. PROPOSED GOALS/OBJECTIVES (please identify quantifiable goals)

|  |
| --- |
| HYPOTHESIS/BASIS OF RESEARCH (if basic research)  GOALS/OBJECTIVES (please quantify your objectives in case of Applied research)   1. Collect Vehicle location coordinates. 2. Collect Vehicle fuel, temperature and speed stats accurately. 3. Sending the collected information to the end user over GSM/ 3G. 4. Receiving the transmitted information over phone device and tracking the vehicle usage.   IDENTIFY END USER (if applied research)  Cargo Services, Business Men, Educational Institutes, Car Owners, etc. |

# 3. INTRODUCTION (not to exceed one page)

|  |
| --- |
| The introduction should consist of three paragraphs; the first paragraph should indicate the hypothesis/rationale on which the project is based. The second paragraph should introduce the precise nature of the project, and the final paragraph should indicate the proposed objectives in the light of the first two paragraphs and explain clearly what the reader will see in the main body of the proposal.  A lot of designs and systems have been developed by many researchers for tracking vehicle. Currently GPS vehicle tracking ensures their safety as travelling. This tracking system found in vehicles as theft prevention and rescue device. Vehicle owner or Police follow the signal emitted by the tracking system to locate a robbed vehicle in parallel the stolen vehicle engine speed going to decreased and pushed to off. After engine is switched off, the motor cannot be restarted without permission of the vehicle owner [1].  In all of these tracking methods only vehicle location (sometimes along with its speed) is monitored. In order to make the system more efficient, the following new features are proposed to be added with the existing tracking system:   * Monitoring vehicle speed * Monitoring RPM reading * Monitoring fuel gauge reading * Monitoring engine temperature reading   Research suggests that when people know they are being watched or simply get the feeling they are being watched, they become more self-conscious and more cautious. This results into a more self-aware driver who is far less likely to have a collision due to over speeding that could cost the personal or company money in repair costs. Similarly, RPM monitoring will result in economic drive which will save fuel. A GPS tracking unit, by simply making the employee feel watched, improves their awareness and decreases their risk behind the wheel [2]. |

4A. BACKGROUND OF THE RESEARCH PROBLEMS TO BE ADDRESSED (Not to exceed two pages)

|  |
| --- |
| Tracking vehicle has been field of research for a long time and lot of research has been done on it. For all research it is mostly tracking location of the vehicle but not its usage. Some of the work done on vehicle tracking is as follows:  The paper presented by El-Medany,W.; Al-Omary,A.; Al-Hakim,R.; Al-Irhayim,S.; Nusaif,M., describes a real time tracking system that provides accurate localizations of the tracked vehicle with low cost. The system is implemented using GM862 cellular quad band module. A monitoring server and a graphical user interface on a website have also been implemented using Microsoft SQL Server 2003 and ASP.net to view the current location of a vehicle on a specific map. System provides information regarding the vehicle status such as speed, mileage. [3]  The Paper presented by Thuong Le-Tien; Vu Phung-The, describes a practical model for routing and tracking with mobile vehicle in a large area outdoor environment based GPS and GSM. System collect positions of the vehicle via GPS receiver and then sends the data of positions to supervised center by the SMS or GPRS service. The supervised center is composed of a development kit that supports GSM techniques-WMP100 of the Wavecom Company. After processing data, the position of the mobile vehicle will be displayed on Google Map.[4]  Paper presented by Lita, I.; Cioc, I.B.; Visan, D.A. is a low cost automotive localization system using GPS and GSM-SMS services. The system permits localization of the automobile and transmitting the position to the owner on his mobile phone as a short message (SMS) at his request. The system is interconnected with the car alarm system and alerts the owner, on his mobile, about the events that occurs with his car when it is parked. The system is composed by a GPS receiver, a microcontroller and a GSM phone. Additional, the system can be settled for acquiring and transmitting of information, when requested, about automobile status and parameters (speed, direction, etc.) or alert when it started engine, exceed a given speed limit or if leave a specific area. By using the PC connection, the system can be used as navigation system. Optional, the system can be used as car tracking system if connected with GSM/ GPRS phone. [5] |

4B. RESEARCH PLAN: SCHEDULE/PHASING (Not to exceed one page)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| The process will be completed in six months and will be conducted in the following phases:  **Phase 1:** Collecting different quotations for the proposed electronic components and purchasing them.  **Time Span:** 1 Month.    **Phase 2:** Circuit designing and implementation.  **Time Span:** 1 Month.  **Phase 3:** Circuit integration with the vehicle.  **Time Span:** 2 weeks.  **Phase 4:** Testing circuit performance over GSM to filter out garbage data.  **Time Span:** 1 Month.  **Phase 5:** DesigningWeb Server.  **Time Span:** 2 weeks.  **Phase 6:** Designing Android Application.  **Time Span:** 1 Month.  **Phase 7:** Testing circuit performance over 3G to filter out garbage data.  **Time Span:** 2 weeks.  **Phase 8:** Final testing of overall project to remove bugs (if any) and enhance its performance.  **Time Span:** 2 weeks.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Phase** | **Description** | **Months 2015** | | | | | | | | | | | | | **Duration** | **March** | **April** | | **May** | | **June** | | **July** | | **Aug** | | | 1 | Components Procurements and Car Simulator Development | 1 |  |  |  | |  | |  | |  | | | 2 | Circuit Implementation | 1 |  |  |  | |  | |  | |  | | | 3 | Integration with Car Simulator | 0.5 |  |  |  | |  | |  | |  | | | 4 | Testing over GSM | 1 |  |  |  | |  | |  | |  | | | 5 | Web Server Designing | 0.5 |  |  |  | |  | |  | |  | | | 6 | Android App Designing | 1 |  |  |  | |  | |  | |  | | | 7 | Testing over 3G | 0.5 |  |  |  | |  | |  | |  | | | 8 | Final Testing | 0.5 |  |  |  | |  | |  | |  | | |

4C. REFERENCES (cited in 3, 4A & 4B; not to exceed two pages)

|  |
| --- |
| [1] R.Ramani; S.Valarmathy; Dr. N.Suthanthira Vanitha; S.Selvaraju; M.Thiruppathi; R.Thangam. “Vehicle Tracking and Locking System Based on GSM and GPS”: I.J. Intelligent Systems and Applications, September 2013  [2] “5 Major Advantages of Vehicle Tracking. <http://www.verilocation.com/5-major-advantages-of-vehicle-tracking/>“ [Accessed On: 20th March, 2015]  [3] El-Medany,W.; Al-Omary,A.; Al-Hakim,R.; Al-Irhayim,S.; Nusaif,M. “A Cost Effective Real-Time Tracking System Prototype Using Integrated GPS/GPRS Module”: Wireless and Mobile Communications (ICWMC), 2010 6th International Conference on,IEEE, 20-25 Sept. 2010  [4] Thuong Le-Tien; Vu Phung. “Routing and Tracking System for Mobile Vehicles in Large Area” : Electronic Design, Test and Application, 2010. DELTA '10. Fifth IEEE International Symposium on , IEEE, 13-15 Jan. 2010  [5] Lita, I.; Cioc, I.B.; Visan, D.A. “A New Approach of Automobile Localization System Using GPS and GSM/GPRS Transmission” : Electronics Technology, 2006. ISSE '06. 29th International Spring Seminar on, IEEE, 10-14 May 2006 |

# 5. IMPACT (of proposed research on teaching/training of manpower, institutional capability building and on local industry)

|  |
| --- |
| It is believed that engaged research is far more likely to have meaningful outcomes and identifiable impacts. It will help us in signifying IM Sciences globally by performing high quality research across a wide range of disciplines and locations. Also, this type of research in our Institute will help our students to have beneficial effects on their learning. |

# 6. FACILITIES AND FUNDING

|  |
| --- |
| 6A. Facilities: equipment available for the research project IN THE HOST UNIVERSITY/INSTITUTION |
| 6B. Scientific Personnel   1. Available 2. Required\*   \*Involvement of research students is encouraged. |
| 6C. Other funding available for the proposed studies (if any) |

# 7. PRINCIPAL INVESTIGATOR

|  |
| --- |
| A brief resume of research accomplished in the last 05 years. Please specify title of the research proposal(s), duration, funding source(s) and award amount(s).  It will provide a base for researchers in IMS and other institutions.  Embedded systems are my area of research. I have been working in this area for the last three years that includes my MS and professional projects. My detail CV is attached here. |
| 1. Please attach C.V.  2. Number of Publications during the last five years & page National: \_\_\_\_\_\_\_\_ Please see pages: \_\_\_\_\_\_\_\_\_\_ of CV  numbers on the C.V. where these publications are listed International: \_\_\_\_\_\_ Please see pages: \_\_\_\_\_\_\_\_\_\_ of CV  3. Number of research projects completed & page number Basic: \_\_\_\_\_\_\_\_\_\_ Please see pages: \_\_\_\_\_\_\_\_\_\_ of CV  where this information appears Applied: \_\_\_\_\_\_\_\_\_\_ Please see pages: \_\_\_\_\_\_\_\_\_\_ of CV |

# 9A. ESTIMATED BUDGET FOR THE PROPOSED RESEARCH PERIOD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DESCRIPTION | % of time devoted to Project | YEAR 1 | YEAR 2 | Amount (in million Rs.) |
| A. Salaries and Honorarium | | | | |
| PI: One month/year of basic salary @ |  |  |  |  |
| Co-PI: One month basic salary for the entire duration @ |  |  | |  |
| Car Simulation Development |  | 60,000/- |  |  |
| Enumerator 1 (for Android App designing/ development) (for 4 months @ 5,000/month) | 60 % | 20,000/- |  |  |
| Enumerator 4 (for Hardware and Web Server Implementation) (for 4 months @ 5,000/month) | 30 % | 20,000/- |  |  |
| Subtotal: |  | **100,000/-** |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| B. Permanent Equipment (Please attach invoice/quotation and expected delivery date for items costing over Rs. 0.1 million.) | | | |
| Android Phone (x1) | 15,000 |  |  |
| Arduino Mega (x4) | 8,000 |  |  |
| GPS Shield (x4) | 12,000 |  |  |
| GPS Module (x4) | 25,000 |  |  |
| GSM/ GPRS Shield (x4) | 20,000 |  |  |
|  |  |  |  |
| Subtotal: | **80,000/-** |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| C. Expendable supplies | | | |
|  |  |  |  |
|  |  |  |  |
| Subtotal: |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| D. Others  D1. Literature, documentation, installation, information, online literature search, contingencies, postage, etc. | | | | | | |
|  |  | | |  |  | |
| Subtotal: | **0/-** | | |  |  | |
| D2. Local Travel (Destination and Purpose) | | | | | | |
|  | |  | |  |  | |
| Subtotal: | | **0/-** | |  |  | |
| D3. Miscellaneous | | | | |  |
| Connecting Wires (Male and Female with connectors) | | | 2,000 |  |  | |
| Bread Board (x4) | | | 1,000 |  |  | |
| Battery (x2) | | | 3,000 |  |  | |
| Web Server (Domain and Hosting) | | | 10,000 |  |  | |
|  | | |  |  |  | |
|  | | |  |  |  | |
| Subtotal: | | | **16,000/-** |  |  | |
| Subtotal (D1 + D2 + D3): | | | **16,000/-** |  |  | |
| E. Indirect cost (University overheads)  02 % of Total direct cost to meet office support, utilities, etc. | | |  |  |  | |
| **Grand Total (A + B + C + D+E):** | | | **Rs.196,000/-** |  |  | |

# 9B. JUSTIFICATION (Please justify your request in a background of the existing facilities available at the host Institute.)

|  |
| --- |
| A. **Salaries & Allowances** (All positions, other than PI and Co-PI, must be fully justified. Please give qualifications/requirements of each of the new full-time positions requested for in the Proposal.)  **Car Simulation Development:** A complete simulation will be developed @ 60,000/-.  **Enumerator 1:** Enumerator (Undergrad Student) will be hired @5,000/- per month for the period of 4 months. He/ She would be responsible for the development and implementation of android application.  **Enumerator 2:** Enumerator (Undergrad Student) will be hired @5,000/- per month for the period of 4 months. He/ She would be responsible for the development and implementation of web server and hardware.  B. **Permanent Equipment** (Please identify major items (over Rs. 25,000). Major pieces of equipment costing over Rs. 0.1 million must be fully justified Minor items (under Rs. 25,000) may be lumped into one.)  C. **Expendable supplies**  D. **Other Costs.** (Travel must be justified.) |