

Status review of the projects funded under State Innovation Fund

1. Name of the Innovation project: Development of Modern State of the art digital forensics facilities in Regional Forensic Science Laboratory
2. Nodal Implementing Agency (s): RFSL Mandi, IIT Mandi
3. Area of Operation /Site of Implementation: RFSL Mandi, IIT Mandi
4. Financial Status:
 - a. Amount Sanctioned (Rs.) 14,97,400 (to IIT Mandi)
 - b. Date of Sanction Nov 7, 2017.....
 - c. Amount Utilized (Rs.) 14,08,837.....
 - d. Balance Amount and its status (Rs.) 88,563 (refunded)
 - e. UC/CC submitted of (Rs.) Complete expenditure (Rs. 14,08,837) and balance (Rs. 88,563)

5. Physical Status

S. No.	Name of the Component	Completed (Yes or No)	Date of starting	If yes, Date of completion	If not, likely date of completion
1	Algorithms for various computational modules with limited validation (see below)	Yes	Jan 2018	Dec 2019	
2	Basic GUI software prototype development	Yes	Jan 2020	Aug 2020	
3	Extensive validation and refinements	Partly			This was delayed and halted as it was difficult to find dedicated manpower during 2020 to 2021 (COVID period). This will be retaken up now and will be self-managed by the PI

					at IIT Mandi, in collaboration with RFSL.
4.	Publications	Yes			

6. Details of activities carried out with the State Innovation Fund (Max. 200 words)

The project involved making a python-based package, that involves some functionalities as given below:

Lens distortion correction, Detecting photo manipulations with inconsistent reflections and shadows, JPEG forgery detection, License plate rectification, License plate enhancement, Single view metrology (with a limited set of objects), face identification, likelihood based extraction of facial image attributes and an automatic speaker identification system. The above computational methods are then packaged in a GUI based software prototype.

Objectives of Innovative Intervention:

- Developing some computational functionalities which were not existing in free / low-cost software for image forensics.
- To ensure that such functionalities can be executed on standalone systems, without the need for server / cloud.
- To develop a software package based on such novel computational functionalities.
- Publish some of the above, considering novel aspects.

7. What are the elements of innovation that were introduced which brought out procedural changes and increased efficiency. Please give a brief: (Max. 200 words)

The project involved developing speaker identification, facial recognition and image processing algorithms and a related software package, which can help at RFSL for analyzing some standard image analysis requirements for forensics analysis. This may help in reducing the subjectivity in manual assessment in such analysis. Further, once such a software framework is developed, further functionalities can be added to it, as updates to the software. An important aspect is to have no dependency on an external server / cloud, so that the algorithms can run on a standalone workstation at RFSL.

8. How the innovation project has benefited the public? (Max. 100 words)

The automatic speaker identification system is up and running but needs to be validated on relevant datasets. Similarly, the facial identification system is also functional and awaits validation. Both these tasks can be taken as separate projects. Once completely and exhaustively validated and refined, the software and the algorithms can make the image based forensic assessment more efficient, which can then benefit the overall investigation pipeline where ever image based forensics is involved.

9. How the innovation project has benefitted the department? (Two or three sentences against each of the following).

a. Procedural simplification

Automatic speaker and facial identification has drastically reduced the analysis time. They have added new tools to the arsenal of RFSL Mandi for forensic analysis.

b. Quick Disposal (Compare pre and post innovation with three examples)

A few cases have been analysed using the automatic facial identification system and such cases could be completed in a day.

c. Convenience for clients (minimum three examples).

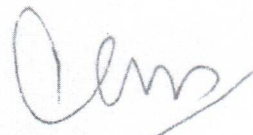
These are very user friendly modules and with a little training can be easily adopted by the clients. The outputs are also easily interpretable.

10. Further steps taken by the department to continue with the Project activities/ innovation ideas?

As indicated earlier, the PI at IIT Mandi, will be continuing collaboration with RFSL Mandi, in order to refine and extensively validate the algorithms and software prototype developed as a part of this project, to bring it up to a practically usable and scalable condition. This process will be self-managed.

11. Suggestion/Comments of the department on State Innovation Fund Scheme?

The state innovation fund scheme is really helpful in providing opportunities to departments to identify their needs and implement solutions that come out of field knowledge and experience.


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