REPORT

Report on participation of the ICMR International Fellow (ICMR-IF) in Training/Research abroad.

1.	Name and designation of ICMR-IF	Dr. Pramod K Gupta Assistant Professor
2.	Address	Department of Biostatistics Cobalt Block 2F, Nehru Hospital Post-Graduate Institute of Medical- Education & Research (PGIMER) Sector-12 Chandigarh 160012 Union Territory (UT), India Phone: 91-172-275-6850 Fax: 91-172-275-6854 Cell: 91-991420-9854 Email: pk_guptain@yahoo.com; guptapkg@gmail.com Web: http://pgimer.edu.in
3.	Frontline area of research in which training/research was carried out.	Biomedical Research
4.	Name & Address of Professor and host Institute.	Prof. Richard L. Smith Statistical and Applied Mathematical Sciences Institute (SAMSI), 19 T.W. Alexander Drive, Research Triangle Park, NC 27709-4006 USA
5.	Duration of Fellowship	Six-Months (Jan 15 – July 15, 2014)

6. Highlights of work conducted

i) Technique/expertise acquired

Topic I: Genetics and Genomics

Teaching & Expertise: Bayesian methods for modeling clinical data and do the required change after model evaluation. Model Development for data related to biomedical research, still under process.

Topic II: Nonlinear Low-dimensional Structures in High-dimensions for Biological Data

Teaching & Expertise: Learned techniques related to agent based modeling or related inference (Dirichlet-multinomial regression) for biomedical data, like brain artery tree networks, gene networks, and biomechanical motion data. Problems related to model

true effect of treatment assignment. Modeling for testable hypotheses for the problem like Interference between Units/causal inferences – None is specific at present.
Topic III: Statistical Methods for Topological Data Analysis

Teaching & Expertise: Learning Topological technique for Data Modeling and representation, use of persistent homology for graphical structure. Medical Image analysis

Topic IV: Causal Inference

Teaching & Expertise: Methods related to Causal inference, e.g. to find the model for genetics based treatment, paradox (Neyman and Fisher) for randomization based causal inference, i.e., statistical inference for causal modeling.

Topic V: Censuses and Surveys

Teaching & Expertise: Some new methodology for missing data problems.

ii) Research results, including any papers Prepared/submitted for publication

Research Project Title-1: New methodology for Index Data Problem

Collaborator(s): Prof. R. L. Smith

Specific Goals & Accomplishments (results): Working problem is related to develop suitable and simple inferential procedure for index data. Index data is related to observation which is unobservable in real situation and thus indexed. In this work, a novel procedure was proposed and primary illustration of proposed method showed benefit over other existing approaches. However, suitability of the approach under more general setup is under process.

Research Contributions: Article is in preparation, could be submitted by the end of August 2014.

Research Project Title-2: Sparse Modeling for clinical Data

Collaborator(s): Prof. Malay Ghosh

Specific Goals & Accomplishments (results): Working Problem is particular one and we are interested in specific prior construction for developing suitable Bayesian modeling process. The work is under progress on a particular track but there is nothing specific to highlight so far.

iii) Proposed utilization of the experience in India

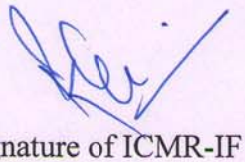
Interactive meeting and promises are there with people for future research and collaboration not only at individual level but also for departmental/institute level through exchange program. As discussed and mentioned above, there are many

interesting topics, particularly, that would lead future collaboration with the group/person. These collaborations become possible only through SAMSI.

Research Area Plans: Few areas of high interest that could of course be explored for further research and collaboration later on, for example, Topological methods Image Analysis, Index data modeling, Sparse Modeling, Problems related to Paradox in connection to randomization based causal inference, modeling with G-prior for Bayesian Inference.

Continuing Collaborations: Collaborations will be continuing as it is and explored further on those problems of common interest. After this program, I shall certainly look to bring these researches beyond my individual interest. To do so, I shall try to procure human and other resources to initiate the same in our department of Biostatistics at home institute by collaboration with SAMSI through exchange program and also by bringing these people at my institute.

SAMSI has great doing by offering specialized topic based course that brings experts and interested researcher at one platform. Different workshops during the course period add fuel to learning and research. The collaboration developed at SAMSI through current research will continue till the work would be finished. However, this collaboration can continue further through the forthcoming programs of SAMSI. I am willing to continue this collaboration further by participating in the next Bioinformatics program of SAMSI which is of my great interest. I will also try to continue this collaboration by suggesting some cutting edge topic for forthcoming SAMSI program with direct contributory role.



Signature of ICMR-IF

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