



ERCIM "ALAIN BENSOUSSAN"  
FELLOWSHIP PROGRAMME



## Scientific Report

First name / Family name

Bijoy Chand Chatterjee

Nationality

Indian

Name of the *Host Organisation*

Norwegian University of Science and  
Technology (NTNU), Norway

First Name / family name  
of the *Scientific Coordinator*

Prof. Norvald Stol

Period of the fellowship

01/05/2018 to 30/11/2018

### I – SCIENTIFIC ACTIVITY DURING YOUR FELLOWSHIP

Our research interest focused on theoretical and practical research themes on networking domains. By utilizing theoretical backgrounds, including mathematical modelling and algorithmic aspects, we would like to design a spectrum management approach for EONs, which offers better network resource utilization and enhance traffic admissibility in the network.

The most important concern regarding spectrum management approaches in EONs is due to its NP-completeness nature. We analysed the time and space complexity of the proposed solution. For the static scenario of our proposed work, we formulated an optimization problem and solve it by commercial LP solvers including CPLEX Optimizer or Groubi Optimizer. We developed efficient heuristic approaches or approximate algorithms when the optimization problem is not tractable. The performance of the proposed scheme, in terms of call blocking, traffic admissibility, and fragmentation metrics, was evaluated using the Monte-Carlo simulation for dynamic traffic in different network topologies, namely — Japan Photonic Network, National Science, and the Indian network.

## II – PUBLICATION(S) DURING YOUR FELLOWSHIP

- I. Zhao, J., Bao, B., Chatterjee, B.C., Oki, E., Hu, J., and Ren, D., "Dispersion based Highest-Modulation-First Last-Fit Spectrum Allocation Scheme for Elastic Optical Networks," IEEE Access, 2018.
- II. Chatterjee, B.C., Sarma, N., Mitra, A., Srivastava, A., Stol, N., and Oki, E., "Performance of Dispersion-Reduced Wavelength Assignment in Wavelength-Routed Optical Networks," 20th International Conference on Transparent Optical Networks (ICTON - 2018), 1-5 July 2018, Bucharest, Romania, paper We.C3.5.
- III. Chatterjee, B.C. and Oki, E., "Performance of Hitless Defragmentation Scheme in Quasi 1+1 Path Protected Elastic Optical Networks," 20th International Conference on Transparent Optical Networks (ICTON - 2018), 1-5 July 2018, Bucharest, Romania, paper Th.A2.4. [Invited paper].

## III – ATTENDED SEMINARS, WORKHOPS, CONFERENCES

20th International Conference on Transparent Optical Networks (ICTON - 2018), 1-5 July 2018, Bucharest, Romania.

## IV – RESEARCH EXCHANGE PROGRAMME (REP)

I plan for a research exchange programme at ISI (Greece) in the third week of November for 3 days and present my research activities.