ABSTRACT

Rapid population growth resulting in residential area spreads nearly all the place. At the same time, growth of needs for communication services is also increasing. This high demand from the community for data services access with high bit rates can be provided by HSDPA technology. High Speed Downlink Packet Access (HSDPA) is one of the latest technology in mobile telecommunication systems which is issued by 3GPP Release 5, it is also known as 3.5-generation technology (3,5 G). To be able to serve high traffic demand and wide coverage area, one of the factor that need to be considered is positioning of HSDPA Node B. Therefore, in this final project, Node B placement in Bandung was designed using Evolutionary Programming simulated in Matlab. Evolutionary programming is one of the artificial intelligence subfield which optimizes solutions of a problem using certain parameters to apply mechanism of natural selection and the genetic manipulation.

HSDPA cells design in this Final Project was done based on traffic capacity and coverage. The frequency used was 2000 MHz, therefore from this cell design, it was obtained that the number of Node are 39 sites with the radius of each 1.28 km. Evolutionary Programming plays an important role in the placement of these 39 Node B to obtain the most optimum position which can cover the demand of traffic and the coverage of Bandung.

Results from Evolutionary Programming simulation obtained Node B HSDPA placement with fitness value of 55329, it means the system can cover 85.66% of the traffic demand and coverage of Bandung, the area covered an area of 143.3 km^2 and the that is not covered an area of 23.99 km^2. The total computing time needed by Evolutionary Programming is approximately 58 hours.

Keywords: HSDPA, Evolutionary Programming