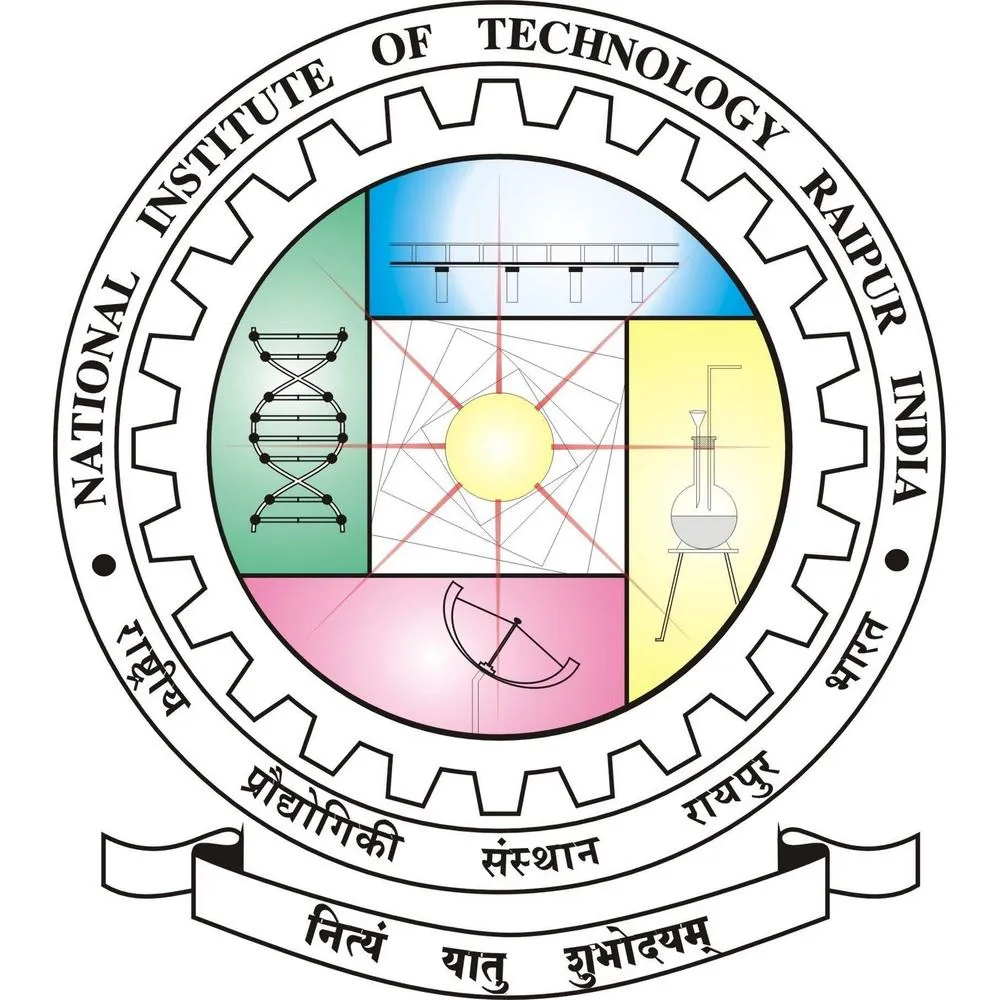
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**National Institute of Technology**

**Raipur**

Term Project Submission

**Red-Black Tree Based Fast and Accurate Ray Tracing for Indoor Radio Wave Prediction**

**By**

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**(5th Semester, Computer Science & Engineering)**

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**Abstract**

Ray tracing is a well-known technique to inves- tigate the multipath propagation in the complex indoor environment. However, it still suffers from the computa- tion time and ray prediction accuracy for the complex indoor environment. Therefore, three dimensional (3D) ray tracing based on the Red-Black tree along with object skipping and surface extraction techniques for the complex indoor environment is presented in this project. The Red-Black tree data structure provides a faster object retrieval mechanism while object skipping technique pre- vents the unnecessary objects to take part in intersection tests, thus accelerates the ray tracing. The obtained results show that the proposed method provides superior results.

**Steps required to run**

To run the project, one should just have to run rb.cpp file.

Steps to run rb.cpp file is given below:

1. Open terminal in your computer
2. Go to the directory where rb.cpp file is located
3. Type command given below in your terminal

*g++ -o <name-you-want-to-give> rb.cpp*

you can give any name for example program etc.

1. Now run the executable file of name that you have given

*program.exe*

For Linux/Mac in Terminal

./rb

Now program is running.

**Why/How to use**

1. Albeit it's not useful for daily life it has very important role in the feild of Electronics and Communication.
2. This study decreases the research time to logarithmically
3. This study is also helpful in letting us see the benifit of Advanced Data Structures use in real life.

**Conclusion**

1. The conclusion obtained is with the help of RBTrees we are able to enforce a new model of Tracing that's more fast and reliable.
2. The help of Advanced Data Structure has improved the efficiency ot the process considerably and helped in benifiting us to use it more amazingly.