**SRM Institute of Science and Technology**

**Faculty of Engineering and Technology**

**Department of Electrical and Electronics Engineering**

**CAPSTONE PROJECT PROPOSAL**

Please print or type the following information:  
  
STUDENT ID NUMBER RA1811005010278  
  
STUDENT GAUTAM NAG   
  
SUPERVISOR Dr. C. NAVEEN

PROJECT TITLE DIGITAL WATERMARKING OF AUDIO SIGNAL FOR INHANCED SIGNAL PROTECTION

Semester (s) to be enrolled \_\_\_\_VIII\_\_\_\_\_\_\_\_ Semester credit hours \_\_\_\_\_12\_\_\_\_\_  
  
Complete the project timeline on reverse and attach a 100-200 word abstract and a preliminary bibliography.  
  
**APPROVAL OF PROPOSAL                                                             DATE** 17.4.2022 **STUDENT** GAUTAM NAG **SUPERVISOR** Dr. C. NAVEEN

**ACADEMIC ADVISOR** Dr. SARVANAN  
 **Head of the Department** Dr. K. Vijaykumar

**PROJECT TIMELINE**  
  
**Week 1** Project Title confirmation and Action Plan. The topic was finalized as DIGITAL WATERMARKING OF AUDIO SIGNAL FOR INHANCED SIGNAL PROTECTION

**Week 2** Finding the specifications according to Literature Survey

**Week 3** Identification of basic Facilities for project and started on the audio classification of audio signal using free and open-source software AUDACITY.  
  
**Week 4** In the consequent week completed the algorithmic study and analysed the QoS analysis.

**Week 5** Started writing the code and tested out possible optimisation techniques using decision boundary machine learning program and extraction of watermark from the audio file.

**Week 6** Testing and validation phase along with the result enhancement of the project

**Week 7** First draft submitted for review ON 18TH MARCH 2022   
  
**Week 8** Oral review of first draft ON 22ND MARCH 2022  
  
This important review of progress in the 7th and 8th weeks is designed to ensure that all three-faculty involved are up to date on progress and to give the student valuable feedback well in advance of the final evaluation. The written draft – which may well be partial at this point but in many cases will include a completed literature review – will be read and commented on by all three readers in advance of the meeting scheduled with the student during the eighth week.  
  
**Week 9** Have matched the code simulation results where it was achieved successfully through inter device audio transmission along various operating systems.

**Week 10** Have completed all documentation work including report, paper, poster and final PowerPoint presentation.   
  
Week 11 \_\_\_\_POSTER PRESENTATION\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
Week 12 Final draft submitted \_\_\_ON 15th APRIL 2022  
  
Week 13 \_\_\_\_\_FINAL PAPERWORK\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
Week 14 Oral defense \_\_\_\_REVIEW\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ABSTRACT**

In today's world we know the importance of encryption and privacy and with data being the most prized possession it is more important than ever to protect that data. Therefore, for our project we are aiming at using this as our principal objective for protecting signal and audio during transmission. To do this will use digital watermarking and using a digital image/unique code superimposing the signal and then transposing that image as a watermark on the audio signal. Watermarking is a technique used to label digital media by hiding copyright or other information into the underlying data. The aim is to create a watermark that must be imperceptible or undetectable by the user and should be robust to attacks and other types of distortion. In our method, the watermark is kept as a digital image or if contingency arises a masked signal copy. We discuss the detection of the watermark and assess the robustness of our watermarking approach to attacks and various signal manipulations. We believe that doing so will uniquely enhance security of the audio signal.

**BIBLIOGRAPHY**

[1] Yonge Wang: On the Design of LIL Tests for (Pseudo) Random Generators and Some Experimental Results. PDF

[2] Nicol, Tony (2015). "Statistical Properties of Pseudo Random Sequences and Experiments with PHP and Debian OpenSSL". Computers and Security. 53: 44–64. doi: 10.1016/j.cose.2015.05.005.

[3] Knuth, Donald (1998). The Art of Computer Programming Vol. 2 : Semi numerical Algorithms. Addison Wesley. pp. 93–118. ISBN 978-0-201-89684-8.

[4] N. Suryana, Siaw-Lang Wong (2010). “An efficient compact Tchebichef Moment for image compression”: Information Sciences Signal Processing and their Applications (ISSPA), 2010 10th International Conference.

[5] S. E. Tsai and S. M. Yang, An Effective Watermarking Method Based on Energy Averaging in Audio Signals: Hindawi Mathematical Problems in Engineering Volume 2018