**Research Paper Checkpoint**

***Team Neighbors: Aayush Bansal, Anish Anand, Cade Santha, Jeffery Valli***

**Research Papers Utilized:**

* [Audio Steganography State of the Art](https://www.sciencedirect.com/science/article/pii/S1574013720304160?casa_token=WqZwEiivsDgAAAAA:ispjaEU3VydeDDABCNCbUyc23zI7V6XgdgPXbnoHIJXykrP4IeqNltvG2grUJCcZVTrpFQIL0g)
  + A review of the methods used to hide messages in audio. 134 articles are examined and their methods are group based on implementation.
* [Steganography Basics](http://profs.scienze.univr.it/~giaco/download/Watermarking-Obfuscation/Steganography%20for%20the%20Computer%20Forensics%20Examiner.pdf)
  + A basic overview of the history, future, and methods of steganography without going into the complex math of Steganography implementation.
* [Steganography and Cryptography](https://iopscience.iop.org/article/10.1088/1742-6596/1339/1/012061)
  + An implementation of steganography and cryptography together which hides encrypted data inside of a file.
* [Use in Cloud](https://www.academia.edu/45064234/A_Review_on_Recent_Steganography_Techniques_in_Cloud_Computing)
  + A look into the possible methods that can be used to protect data being transferred over the cloud using steganography. This will be useful as there is a large shift to Cloud-based data storage and hosting.
* [Cyber security, Steganography, and Steganalysis](https://link.springer.com/article/10.1007/s11042-020-09929-9)
  + An overview of steganography and steganalysis (study of the detection of messages hidden via steganography), image and video applications of steganography, trends, techniques, and the application of machine and deep learning
  + This source provides a detailed overview of steganography that is flush with examples and written in such a way that the average person could understand it.
* [Exploring Steganography: Seeing the Unseen](http://scholar.google.com/scholar_url?url=http://madchat.fr/crypto/stegano/r2026.pdf&hl=en&sa=X&ei=gIlOYIG0HY6WywTCmLiIBg&scisig=AAGBfm2OcVIv0Jlrk7kQd2w5XTTntFIBwA&nossl=1&oi=scholarr)
  + Covers steganography methods including stego-images, masking and filtering techniques, algorithms and transformations and gives a brief overview of common steganography tools/software.
* [Misdirection Steganography](https://proxy.lib.ohio-state.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=146367545&site=ehost-live)
  + Now that the common tactics of Steganography are becoming more widely used and documented, the effectiveness of them decreases, as people understand the techniques used. The idea of Misdirection Steganography is that there is the creation of a trick “solution” and a true “solution”. If the typical tactics of Steganography are implemented, the person trying to find the message will get to a fake message. However, if the “secret pathway” is utilized within the media used, the true meaning will be uncovered. This method shows how the utilization of Cryptography and Steganography together can create extremely secure messages.
* [Common Approaches and Tools](https://proxy.lib.ohio-state.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=90098619&site=ehost-live)
  + There are many types of Steganography and it is quite difficult to clearly illustrate each of them and their implementations. This research paper clearly explains the high and low levels of the types of Steganography and explores them in a hierarchical fashion. We plan on implementing the research from this paper to guide our reader through the various classifications of Steganography and the tactics to utilize to uncover the messages hidden within.
* [Code Wars: Steganography, Signals Intelligence, and Terrorism](https://proxy.lib.ohio-state.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=11694106&site=ehost-live)
  + Steganography has been a part of many news headlines in relation to work being done by the FBI to uncover cyber crimes, in conjunction with Cryptography. This research paper covers key news-worthy moments regarding the usage of Steganography. This paper also dives into Steganalysis, which is the science of detecting hidden messages, and how it has been utilized to solve crime by the FBI throughout time.

**Outline:**

**Background / The Basics:**

* [Steganography Basics](http://profs.scienze.univr.it/~giaco/download/Watermarking-Obfuscation/Steganography%20for%20the%20Computer%20Forensics%20Examiner.pdf)
* [Cyber security, Steganography, and Steganalysis](https://link.springer.com/article/10.1007/s11042-020-09929-9)
* [Common Approaches and Tools](https://proxy.lib.ohio-state.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=90098619&site=ehost-live)
* [Exploring Steganography: Seeing the Unseen](http://scholar.google.com/scholar_url?url=http://madchat.fr/crypto/stegano/r2026.pdf&hl=en&sa=X&ei=gIlOYIG0HY6WywTCmLiIBg&scisig=AAGBfm2OcVIv0Jlrk7kQd2w5XTTntFIBwA&nossl=1&oi=scholarr)

**The Intersection between Steganography and Cryptography:**

* [Steganography and Cryptography](https://iopscience.iop.org/article/10.1088/1742-6596/1339/1/012061)
* [Misdirection Steganography](https://proxy.lib.ohio-state.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=146367545&site=ehost-live)

**Types of Steganography:**

* [Audio Steganography State of the Art](https://www.sciencedirect.com/science/article/pii/S1574013720304160?casa_token=WqZwEiivsDgAAAAA:ispjaEU3VydeDDABCNCbUyc23zI7V6XgdgPXbnoHIJXykrP4IeqNltvG2grUJCcZVTrpFQIL0g)
* [Common Approaches and Tools](https://proxy.lib.ohio-state.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=90098619&site=ehost-live)
* [Cyber security, Steganography, and Steganalysis](https://link.springer.com/article/10.1007/s11042-020-09929-9)

**Steganography in Action:**

* [Use in Cloud](https://www.academia.edu/45064234/A_Review_on_Recent_Steganography_Techniques_in_Cloud_Computing)
* [Cyber security, Steganography, and Steganalysis](https://link.springer.com/article/10.1007/s11042-020-09929-9)
* [Code Wars: Steganography, Signals Intelligence, and Terrorism](https://proxy.lib.ohio-state.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=11694106&site=ehost-live)

**The Future of Steganography:**

* [Audio Steganography State of the Art](https://www.sciencedirect.com/science/article/pii/S1574013720304160?casa_token=WqZwEiivsDgAAAAA:ispjaEU3VydeDDABCNCbUyc23zI7V6XgdgPXbnoHIJXykrP4IeqNltvG2grUJCcZVTrpFQIL0g)
* [Code Wars: Steganography, Signals Intelligence, and Terrorism](https://proxy.lib.ohio-state.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=11694106&site=ehost-live)

**Final Comments/Conclusion of the Topics Covered**