



University  
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Computing Science

# **A secure client-server mobile chat application implementing elliptic curve integrated encryption system (ECIES) and other security features.**

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## **Abstract**

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## **Acknowledgements**

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# **Chapter 1: Introduction**

Secure messaging apps intro

## **1.1 Why are secure chat applications needed?**

### **1.1.1 Family & friends**

### **1.1.2 Whistleblowers & journalists**

### **1.1.3 Political dissidents**

### **1.1.4 Crime**

### **1.1.5 Data security**

## **1.2 Existing applications in this field**

### **1.2.1 Telegram**

### **1.2.2 Whatsapp**

### **1.2.3 Signal**

## **1.3 Issues**

### **1.3.1 Closed source**

### **1.3.2 Tradeoffs between security and usability features**

### **1.3.3 Nation state control**

## **Chapter 2: Analysis/Requirements**



# **Chapter 3: Design & Implementation**

## **3.1 Tools Used**

There are two primary components to the overall system - one or more clients applications which communicate with a central server.

### **3.1.1 Client**

The final client application was written entirely in Kotlin (v1.6.10) using the Android Studio IDE.

**BouncyCastle**

**Room ORM**

### **3.1.2 Server**

### **3.1.3 Report**

This dissertation was written entirely using Vim with the VimTex plugin.

## **3.2 Encryption Implementation**

### **3.2.1 Asymmetric component**

### **3.2.2 Symmetric component**

### **3.2.3 Difficulties**

### **3.2.4 Storage of encryption keypair**

## **3.3 Persistence and storage considerations**

### **3.3.1 Storage of self-destruct duration**

### **3.3.2 Existing user persistence and reconnection flow**

## **3.4**

## **3.5**

## **Chapter 4: Evaluation & Testing**

## **Chapter 5: Conclusion**

# **Appendix A: First appendix**

## **A.1 Section of first appendix**

## **Appendix B: Second appendix**

# **Bibliography**