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**DATE OF DISPUTATION:** 20. December 2017

**DISSERTATION TITLE:** *Data Loss Prevention for Cross-Domain Information Exchange*

**In this thesis, novel methods are introduced for preventing and detecting incidents where sensitive data is leaked to third parties. The methods proposed are especially suitable for situations where isolated military systems are to be connected.**

Loss of sensitive data is a widespread problem with potentially severe consequences. The topic of this thesis revolves around the construction of methods for detecting and preventing such incidents in situations where it is necessary to exchange information across computer systems. This is a scenario which is common in the military sector where one often needs to transfer information between systems that have been compartmentalised for security reasons. Increasingly data labelling-based security mechanisms are also being utilized in the civilian sector.

The users of existing systems must manually specify the security classification level for each individual file before it can be transferred. For example, an email can be labelled as “Unclassified” before it is sent to an external recipient. This assumes that the user is behaving non-maliciously and always assigns the correct security labels. To address this shortcoming, we have developed mathematical methods that, using the textual contents, predicts the appropriate security classification level. By inspecting all documents that are transferred between computer systems we are then able to decrease the likelihood of sensitive data leaking to third parties.

The work has been conducted at the Norwegian Defence Research Establishment in collaboration with the Institute of Technology Systems.