



University
of Victoria

Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

JORIN WEATHERSTON

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**“Visualizing Uncertainty in Drug Checking Test Result Reports during
the Opioid Crisis: A Design Study”**

Department of Computer Science

Friday, February 14, 2020

9:30 A.M.

Engineering Computer Science Building
Room 660

Supervisory Committee:

Dr. Margaret Storey, Department of Computer Science, University of Victoria (Supervisor)

Dr. Dennis Hore, Department of Computer Science, UVic (Member)

Dr. Charles Perin, Department of Computer Science, UVic (Member)

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Dr. Scott McIndoe, Department of Chemistry, University Of Victoria

Chair of Oral Examination:

Dr. Eike-Henner Kluge, Department of Philosophy, UVic

Abstract

Potent opioids (Fentanyl) are entering recreational drug manufacturing processes without the knowledge of people who use drugs. This is resulting in tens of thousands of accidental overdose deaths each year. Recreational drug checking services during the opioid crisis face unique challenges in delivering test results to people who use drugs. These challenges are caused by uncertainties in drug composition, the chemical analysis processes used, and the complex contextual considerations of drug checking services themselves. In this thesis I describe a design study in collaboration with a local drug checking service to explore visualizing uncertainty in drug checking test result reports. From this research we generate a number of research contributions. I have identified the new and impactful application domain of visualizing uncertain drug checking test results. Within this application domain I conducted a design study to generate a test result report that suits the problem context and accomplishes the design goals described by the drug checking service stakeholders. This design study generates reflective considerations on conducting design studies in this context, intermediate design artifacts, and finally a test result report software application. The design study also led to the identification of a new uncertainty visualization design space for proportional charts. I apply that design space in the generation of some intermediate design artifacts. I position these research contributions within the drug checking and uncertainty visualization research fields, and describe our planned future work in the hopes that future research will positively impact the application domain.