

Research area and working title.

Area of Research: Privacy concerns raised in the implementation of Connected Vehicle Technology

Working Title: Reidentifying previously anonymized vehicle IDs from captured and/or published CV data.

Proposed Research Problem and Research Question.

Connected Vehicle technology offers a large leap forward in reaching “Vision Zero”, a goal of eliminating all traffic deaths attributable to distracted driving. This technology carries significant risk of exposing privacy information and as such has many regulations and specifications aimed at mitigating these risks. The primary techniques for ensuring privacy are anonymizing vehicle IDs and randomly changing the IDs every 5 minutes.

This research will investigate: whether the currently implemented safeguards provide an acceptable efficacy; and critically examine if the next generation of safeguards under proposal by the industry will add any substantial improvement?

Proposed Aims and Objectives.

- Summarize the CV technology, benefits to society, and challenges of secure implementation.
- Critically examine the evolution of the privacy threat surface and implemented mitigations.
- Critically examine existing research literature covering privacy and security of connected vehicles.
- Develop an experimental project upon which to test/validate author’s thesis on CV’s remaining privacy weaknesses.
- Propose areas for further research and development for CV to close identified privacy protection gaps.

Proposed Research Design.

- Critical evaluation via literature review, surveys, interviews, et al; of the current efficacy of privacy protections available to CV users.
- Present a theory of one way in which previously anonymized CV vehicles may be trivially reidentified.
 - Using published, anonymized CV Data.
 - Using live captured, anonymized CV data.
- Validate by data visualization/mapping that theorized method of reidentification is possible.
- Discuss potential additional mitigation processes for consideration, experimentation.
- Discuss the ethical issues raised and the potential conflicts between diverse ethical models. IE:
 - Is the moral imperative to save lives greater than the ethical mandate to protect privacy?
 - How does the ACM code of ethics apply to the development of CV with known privacy issues?
 - How does the ACM code of ethics apply to Government agencies or private firms that publish CV data for open use with known privacy risks?
 - How does GDPR apply and to whom?

Artefact(s) that can be created.

- Data visualization mapping diagrams
- Data visualization videos demonstrating real-time tracking and unmasking of anonymized CVs