

# Class revisions, exercise C: Warble and TransformeR

## The Engineering Method of Technical Writing

14 October 2016

### Versions of paragraph A

#### Matt's original

Increasingly, consumers grow dependent on wearable computers and devices, called wearables, for fitness, medical, and recreational usage along side their cellphones and other personal computing devices. As the ability of these wearables mature, niche consumers are demanding more specific and personalized uses than the general hardware manufacturers can provide. To meet these demands, open source and educational hardware initiatives including RaspberryPi, BeagleBone, NextThingCo, Sseed Studio, and Adafruit produce inexpensive, customizable, and interchangeable hardware components for making wearables. These initiatives attract a community of makers, people skilled in programming, engineering, design, and crafting to various degrees. Many general programming languages and code libraries allow these makers to create their wearables but impede the novice maker's ability. These existing tools introduce idioms that increase the maker's learning curve and disrupt the maker's mental model of the program by requiring boiler plate and glue code extraneous to how the wearable behaves.

#### Abby's revision

Consumers are depending more on wearable computers and devices (wearables) for fitness, medical, and recreational usage. While wearables increase in popularity, niche consumers are demanding more specific and personalized uses than the general hardware manufacturers can provide. To meet these niche demands, open source and educational hardware initiatives including RaspberryPi, BeagleBone, NextThingsCo, Speed Studio, and Adafruit produce inexpensive, customizable, and interchangeable hardware components for making wearables. These components attract makers, people skilled in programming, engineering, design, and crafting. Makers may create wearables using many general programming languages and code libraries, however such tools impede the novice makers ability. Existing tools introduce idioms, such as requiring boiler plate and glue code extraneous to

how the wearable behaves, that increase the makers learning curve and disrupt their mental model of the program.

#### Jason's revision

As consumers depend more and more on wearables alongside their cellphones and other personal computing devices, the abilities of these wearables also continue to mature. Moreover, niche consumers are beginning to demand more specific and personalized hardware than general manufactureres can provide. To meet these demands, open source and education hardware initiatives such as RaspberryPi, BeagleBone, NextThingGo, Sseed Studio, and Adafruit produce inexpensive hardware components that are customizable and interchangeable. These initiatives attract a community of makers who are oftentimes already skilled in programming engineering and design, and for these makers, many general PLs, libraries and tools, provide a rich environment for creating wearables. However, the same rich set of PLs, libraries and tools impede the novice maker's ability. More precisely, existing tools require boilerplate and glue code extraneous to how wearables behave and introduce idioms that disrupt a novice maker's mental model of the program.

#### Karl's revision

Daily tasks are increasingly being automated through the use of wearable computers and devices called wearables. For example, we use various wearable devices to track our fitness and record medical information for the purpose of bettering ourselves. As the ability of wearables to make our lives better increases, nice consumers demand wearables with functionality for more specific and personalized use cases. Many use cases are supported directly by general purpose devices provided by hardware manufacturers, but not all. As a result the demand for these use cases is handled by open source and educational hardware initiatives. Among these intiatives are the RaspberryPi, BeagleBone, NextThingCo, Sseed Studio, and Adafruit, each of whom prouduce inexpensive, customizable, and interchangeable hardware components for the purpose of specializing general purpose wearables.

## Versions of paragraph B

### Remy's original

On the daily agenda of social scientists is the task of preparing datasets for statistical algorithms, be it removing outliers, selecting variables, or performing logarithm transformations. In this paper we refer to such process as variable transformation. Arbitrary variable transformations that work at the level of single individual data can be safely applied before applying a differential private data analysis if an adversary only gets to observe the result of the differential private analysis. The current version of the PSI prototype offers support for writing variable transformations as R programs that can be run on the data before running the other private statistics. Arbitrary R programs can allow for leakage of information beyond the output, and “side-channel attacks” [2] where an adversary observes this additional leakage and thereby undermines the privacy guarantees.

### Brian's revision

Social scientists routinely prepare datasets using variable transformations. Such transformations include removing outliers, selecting variables, or performing logarithm transforms, and in general they operate on a single datum at a time without regard for the rest of the dataset. Applying such a transformation to a dataset does not undermine differential privacy guarantees. Unfortunately, the current version of the PSI prototype hands each datum to an unrestricted R program. Arbitrary R programs can leak information through various means, which would undermine the system's privacy guarantees.

### Moses's revision

Social scientists often work with real-world data that is messy and unfit for direct analysis. In turn, scientists spend a good part of their day cleaning and transforming the data for downstream statistical analysis. Some of these transformations include removing outliers, selecting variables, or performing logarithm transformations. In this paper we refer to this process as variable transformations. While the majority of transformations are innocuous, there is a minority that may cause privacy leaks.

### Xinmeng's revision

Social scientists focus on tasks, such as preparing datasets for statistical algorithms, removing outliers, selecting variables or performing logarithm transformations, which we refer to as variable transformation.

Variable transformation before differential private data analysis on single individual data is safe, since only the result is observed. Variable transformation is supported by the current version of the PSI prototype, written as R programs. These R programs can cause a leakage of additional information and “side-channel attacks.” This leakage of information undermines the privacy guarantee.