



Learning Inference Statistical with Mobile Devices

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Abstract

Mobile learning (m-learning) enhances learning skills in some students. Mobile phones, tablets, PDAs, Pocket PCs, and the Internet can be used together to encourage and motivate learning wherever and whenever students want to learn. In statistical inference, one wishes to estimate population parameters using observed sample data. A confidence interval gives an estimated range of values which is likely to include the unknown population parameter. This estimated range is calculated from a given set of sample data [1]. In this work, we present learning objects for teaching and learning statistical inference using mobile devices. With these applications, the students can calculate confidence intervals for both the population's average and proportion, based in either a large or a small data sample obtained from a normal, quasi-normal, or a non-normal population. The confidence intervals are calculated using a density function, either the normal distribution or the Student distribution, according to the size of the data sample ($n \geq 30$ or $n < 30$, respectively). If the population has a non-normal distribution, the application uses Chebyshev's theorem for calculating the interval confidence for the mean. These objects are been designed for devices with Android operating system, which is an open Linux-based operating system developed by Google and designed primarily for touchscreen mobile devices such as smartphones and tablet computers. The use of Android as a development platform is important because, according to IDC (International Data Corporation) [2,3], Android had a worldwide smartphone market share of 75% during the third quarter of 2012 with 500 million devices activated in total and 1.3 million activations per day.

This work shows the advance of second stage of the project Statistics-to-Go [4] that we are developing at the Department of Mathematics of the University of Sonora (Mexico). Future work includes the design of different applications to complement the teaching and learning of statistical inference such as confidence intervals for estimating the difference between two means or between two proportions of two populations, confidence intervals for estimating the variance of a population, and confidence intervals for estimating the quotient of two variances.

References

- [1] <http://www.stat.yale.edu/Courses/1997-98/101/confint.htm>.
- [2] <http://www.idc.com/>
- [3] [http://en.wikipedia.org/wiki/Android_\(operating_system\)](http://en.wikipedia.org/wiki/Android_(operating_system))
- [4] http://www.pixel-online.net/edu_future2012/conferencepresentations.php