1145-03-59   **Luke S Serafin*** (`lserafin@alumni.cmu.edu`), 33838 N 83rd St., Scottsdale, AZ 85266. *A Formally Verified Proof of the Central Limit Theorem.*

We describe the results of a collaborative effort to formalize the proof of the central limit theorem of probability theory. This project was carried out in the Isabelle proof assistant, and builds upon and extends the libraries for mathematical analysis, in particular measure-theoretic probability theory. The formalization introduces the notion of weak convergence (also known as convergence in distribution) required to state the central limit theorem, and uses characteristic functions (Fourier transforms) to demonstrate convergence to the standard normal distribution under the hypotheses of the central limit theorem. Supporting such reasoning motivated significant changes to the measure-theoretic integration libraries of Isabelle. (Received July 15, 2018)