

# Convolution Generator

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## Convolution Generator

This package provides tools for creating visual aids to help students develop intuition as to how the Normal Distribution, and similar distributions that arise from the sum of many random variables, comes to form. It contains tools for generating .mp4 videos of convolutions of density functions, as well as tools for plotting sums of discrete random variables.

### Installation

Installing from GitHub:

```
devtools::install_github("bsnyder1993/ConvolutionGenerator")
```

**Installing Necessary Packages** This package requires the packages “ggplot2”, “magick”, “magic”, and “av” in order to render plots and videos.

```
install.packages("ggplot2")
install.packages("magick")
install.packages("magic")
install.packages("av")
```

### Overview

This package contains tools for generating .mp4 visual representations of convolutions. It includes tools for generating distribution functions, and then creating a video of the convolution of said distribution.

The video shows a plot of the input function  $f(x)$ , a distribution function with mean 0, on the interval  $-a \leq x \leq a$ , and then displays  $f(x - t)$  as  $t$  varies over the domain, as well as  $\int f(x) \cdot f(x - t) dt$ .

Explanation on how to use the functions to generate a .mp4 file as well as visual representations of the output can be found in the tutorial vignette.