

# TikZ for Cryptographers

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  - The results usually look really good.
  - It can produce reusable PDF images.

# Contribution

## An online repository of TikZ figures.

L<sup>A</sup>T<sub>E</sub>X

101 TikZ figures

Search...

AE 7

AES 13

Block ciphers 12

Construction 11

Cryptanalysis 20

Feistel 4

General 1

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Modes 3

### TikZ for Cryptographers

#### What is TikZ?

PGF/TikZ is a tandem of languages for producing vector **graphics** from a geometric/algebraic description. PGF is a lower-level language, while TikZ is a set of higher-level macros that use PGF. The top-level PGF and TikZ commands are invoked as TeX macros. Together with the LaTeX language, it is the most efficient way to write **research papers**.

[More from Wikipedia.](#)

#### How to contribute

Do you have any TikZ code that you are willing to **share**? If yes, please do not hesitate to send me an **email** with the images, and I will look into including them into this repository.

#### News

- 2015-02-23 Added 4 figures.
- 2015-02-20 Added 12 figures.
- 2015-02-07 Added 84 figures.
- 2015-02-07 Website is up.



#### How to use this repository

You can browse the available figures by using the left menu, either selecting one of the **categories**, or by **searching** for a keyword in the dedicated field. A sublist of the corresponding figures will then appear, and choosing any will display the actual compiled image (in low-quality for efficiency reasons) together with its associated LaTeX code generating it. From there, you can download the actual code and/or PDF, as well as some custom packages.



#### Free of use

All the TikZ images and codes available of this website are **free of use**. You can use them to create your owns, modify them as much as you want, and include them in any documents. Nevertheless, we would be grateful if you could **cite** this repository as a source of inspiration. :-)



#### Contact

My name is **Jérémy Jean**, and you can contact me about this repository at this email address: [JJean\(at\)ntu\(dot\)edu\(dot\)sg](mailto:JJean(at)ntu(dot)edu(dot)sg).  
My webpage is online here: <http://www.di.ens.fr/~jean/>.

[http://www.di.ens.fr/~jean/latex\\_crypto/](http://www.di.ens.fr/~jean/latex_crypto/)

# Example

You look for the round function of the PRESENT block cipher.

The screenshot shows a LaTeX search interface with a sidebar on the left and a main content area on the right. The sidebar contains a search bar and a list of categories with their respective counts. The main content area displays search results for 'PRESENT block cipher', including a title, author, date, section, required packages, and download files. A red box highlights the 'PRESENT block cipher' entry in the sidebar, and a red arrow points from it to the corresponding search result in the main content area. Another red box highlights the 'Block ciphers' category in the sidebar.

**Block ciphers** 12

**PRESENT block cipher**

**Title:** PRESENT block cipher.  
**Author:** Jérémy Jean.  
**Date:** February 2015.  
**Section:** Block ciphers.  
**Required packages** : crypto symbols • custom arrows.  
**Download files:** PNG • PDF • TEX.

```
\documentclass{standalone}

%% Common TikZ libraries
\usepackage{tikz}
\usetikzlibrary{calc}
\usetikzlibrary{positioning}

%% Custom TikZ addons
\usetikzlibrary{crypto.symbols}
\tikzset{shadows=no} % Option: add shadows to XOR, ADD, etc.

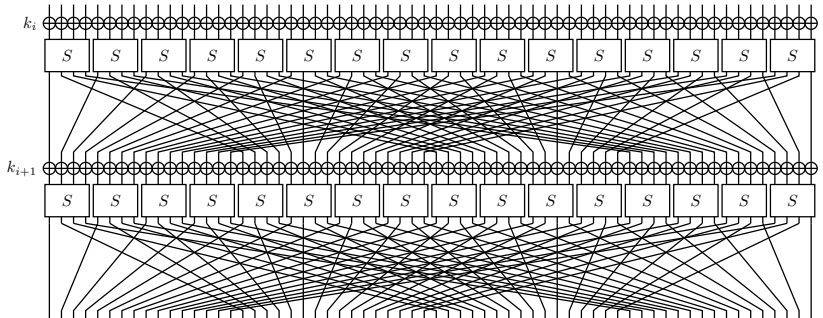
%% Document
\begin{document}
\begin{tikzpicture}
```

# Example

```
12 %% Document
13 \begin{document}
14 \begin{tikzpicture}
15
16   %% Subkey XORs
17   \foreach \z in {0,...,63} {
18     \node[XOR, scale=0.8] (xor\z) at ($\z*(0.75em, 0)$) {};
19     \node[XOR, scale=0.8] (xorr\z) at ($\z*(0.75em, 0)+(0,-9em)$) {};
20   }
21
22   %% Nodes positions
23   \foreach \z in {0,...,63} {
24     \node (i\z) [above = 0.75em of xor\z] {};
25     \node (o\z) [below = 2.5em of xor\z] {};
26     \node (ii\z) [above = 0.25em of xorr\z] {};
27     \node (oo\z) [below = 3em of xorr\z] {};
28     \node (t\z) [below = 4em of oo\z] {};
29     \draw[thick] (i\z) -- (xor\z);
30   }
31
32   %% Permutation layer
33   \foreach \z [evaluate=\z as \zz using {int(mod(16*\z,63))}] in {0,...,62} {
34     \draw[thick] (xor\z) -- (o\z.center) -- (ii\zz.center) -- (xorr\zz) -- (oo\zz);
35     \draw[thick] (oo\z.north) -- (t\zz.south) -- +(0,-0.5em);
36   }
37   \draw[thick] (xor63) -- (o63.center) -- (ii63.center) -- (xorr63) -- (oo63);
38   \draw[thick] (oo63.north) -- (t63.south) -- +(0,-0.5em);
39
40   %% SBoxes
41   \foreach \z in {0,...,15} {
42     \node[draw,thick,minimum width=2.75em,minimum height=2em,fill=white] (p4) at ($\z*(3em,0) + (1.1em,-2em)$) {$$$};
43     \node[draw,thick,minimum width=2.75em,minimum height=2em,fill=white] (p4) at ($\z*(3em,0) + (1.1em,-11em)$) {$$$};
44   }
45
46   \node[left = 0em of xor0] {$k_{i}$};
47   \node[left = 0em of xorr0] {$k_{i+1}$};
48
49 \end{tikzpicture}
50 \end{document}
```

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- Gather all crypto-related pictures in a single place.
- **Encourage you to submit and share your crypto figures!**



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