

TikZ in 10 minutes

Édouard Bonnet

FPT seminar, special edition on tools

March 25th, 2016

Advantages

- ▶ produce really neat figures
- ▶ all in the tex file, lighter sources
- ▶ coauthors do not need to install a software to edit your figures
- ▶ very modular for slight changes:
you can easily re-use your figures, share them
- ▶ for loop (other nice features: scope, transparency, clip, etc.)

```
\usepackage{tikz}  
:  
\begin{tikzpicture}  
...  
\end{tikzpicture}
```

```
\node (v1) at (0,0) {} ;
```

```
\node (v1) at (0,0) {$v_1$} ;
```

v_1

```
\node[draw,circle] (v1) at (0,0) {$v_1$} ;
```



```
\node[draw,rectangle] (v1) at (0,0) {$v_1$} ;
```

A diagram showing a rectangular node labeled v_1 . The node is a simple black-outlined rectangle with the text v_1 centered inside it.

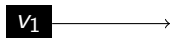
```
\node[fill,rectangle] (v1) at (0,0) {$v_1$} ;  
\node (v2) at (2,0) {} ;
```



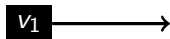

```
\node[fill,rectangle] (v1) at (0,0)
{\textcolor{white}{$v_1$}} ;
\node (v2) at (2,0) {} ;
\draw (v1) -- (v2) ;
```



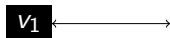
```
\node[fill,rectangle] (v1) at (0,0)
{\textcolor{white}{$v_1$}} ;
\node (v2) at (2,0) {} ;
\draw[->] (v1) -- (v2) ;
```



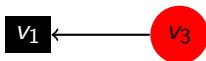
```
\node[fill,rectangle] (v1) at (0,0)
{\textcolor{white}{$v_1$}} ;
\node (v2) at (2,0) {} ;
\draw[->,very thick] (v1) -- (v2) ;
```



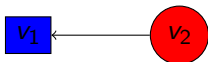
```
\node[fill,rectangle] (v1) at (0,0)
{\textcolor{white}{$v_1$}} ;
\node (v2) at (2,0) {} ;
\draw[<->,very thin] (v1) -- (v2) ;
```



```
\node[fill,rectangle] (v1) at (0,0)
{\textcolor{white}{ $v_1$ }} ;
\node[fill=red,circle] (v2) at (2,0) { $v_3$ } ;
\draw[<- ,very thin] (v1) to (v2) ;
```



```
\node[draw,fill=blue,rectangle] (v1) at (0,0) {$v_1$} ;  
\node[draw,fill=red,circle] (v2) at (2,0) {$v_2$} ;  
\draw[<-] (v1) to (v2) ;
```



```
\node[draw,fill=blue,rectangle] (v1) at (0,0) {$v_1$} ;  
\node[draw,fill=red,circle] (v2) at (2,0) {$v_2$} ;  
\draw[<-] (v1) to (v2) ;  
\fill (0,-2) -- (-1,-2) -- (-2,-3) -- (-0.3,-3) ;
```



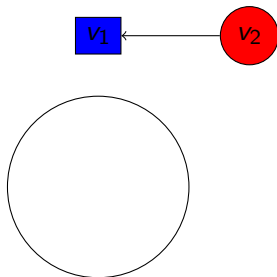
```
\node[draw,fill=blue,rectangle] (v1) at (0,0) {$v_1$} ;  
\node[draw,fill=red,circle] (v2) at (2,0) {$v_2$} ;  
\draw[<-] (v1) to (v2) ;  
\fill (0,-2) -- (-1,-2) -- (-0.3,-3) -- (-2,-3) ;
```



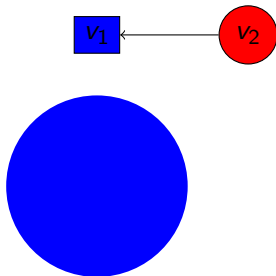

```
\node[draw,fill=blue,rectangle] (v1) at (0,0) {$v_1$} ;  
\node[draw,fill=red,circle] (v2) at (2,0) {$v_2$} ;  
\draw[<-] (v1) to (v2) ;  
\fill (0,-2) -- (-0.3,-3) -- (-1,-2) -- (-2,-3) ;
```



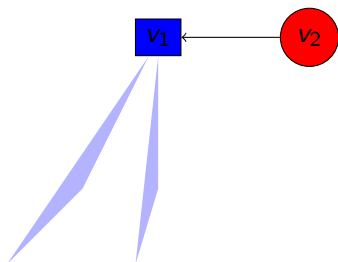
```
\node[draw,fill=blue,rectangle] (v1) at (0,0) {$v_1$} ;  
\node[draw,fill=red,circle] (v2) at (2,0) {$v_2$} ;  
\draw[<-] (v1) to (v2) ;  
\draw (0,-2) circle (1.2) ;
```



```
\node[draw,fill=blue,rectangle] (v1) at (0,0) {$v_1$} ;  
\node[draw,fill=red,circle] (v2) at (2,0) {$v_2$} ;  
\draw[<-] (v1) to (v2) ;  
\fill[blue] (0,-2) circle (1.2) ;
```



```
\node[draw,fill=blue,rectangle] (v1) at (0,0) {$v_1$} ;  
\node[draw,fill=red,circle] (v2) at (2,0) {$v_2$} ;  
\draw[<-] (v1) to (v2) ;  
\fill (0,-2) -- (-0.3,-3) -- (-1,-2) -- (-2,-3) ;  
\fill[blue,opacity=0.3] (-0.3,-3) -- (0,-2) -- (v1)  
-- (-1,-2) -- (-2,-3) -- cycle ;
```



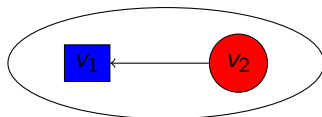
```
\usetikzlibrary{fit}
```

```
\node[draw,fill=blue,rectangle] (v1) at (0,0) {$v_1$} ;
```

```
\node[draw,fill=red,circle] (v2) at (2,0) {$v_2$} ;
```

```
\draw[<-] (v1) to (v2) ;
```

```
\node[draw,ellipse,fit=(v1) (v2)] (ell) {} ;
```



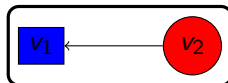
```
\usetikzlibrary{fit}

\node[draw,fill=blue,rectangle] (v1) at (0,0) {$v_1$} ;
\node[draw,fill=red,circle] (v2) at (2,0) {$v_2$} ;
\draw[<-] (v1) to (v2) ;
\node[draw,rectangle,very thick,fit=(v1) (v2)] (rec) {} ;
```

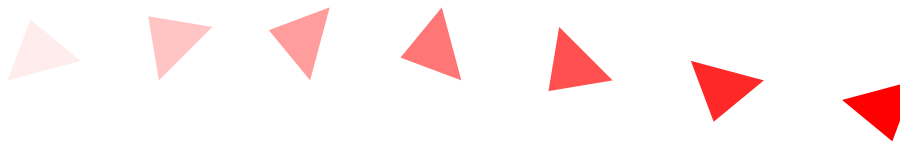


```
\usetikzlibrary{fit}

\node[draw,fill=blue,rectangle] (v1) at (0,0) {$v_1$} ;
\node[draw,fill=red,circle] (v2) at (2,0) {$v_2$} ;
\draw[<-] (v1) to (v2) ;
\node[draw,rectangle,rounded corners,very thick,
fit=(v1) (v2)] (rec) {} ;
```



```
\foreach \i in {1,3,...,13}{  
  \begin{scope}[xshift=\i cm, rotate=15*\i]  
    \fill[red,opacity=\i / 13] (0,0) -- (1,0) -- (0.5,0.7);  
  \end{scope}  
}
```




```
\foreach \i in {1,...,10}{  
  \foreach \j in {1,...,10}{  
    \pgfmathtruncatemacro{\ij}{\i * \j}  
    \node (\i-\j) at (\i,\j) {$\ij$} ;}}
```

10	20	30	40	50	60	70	80	90	100
9	18	27	36	45	54	63	72	81	90
8	16	24	32	40	48	56	64	72	80
7	14	21	28	35	42	49	56	63	70
6	12	18	24	30	36	42	48	54	60
5	10	15	20	25	30	35	40	45	50
4	8	12	16	20	24	28	32	36	40
3	6	9	12	15	18	21	24	27	30
2	4	6	8	10	12	14	16	18	20
1	2	3	4	5	6	7	8	9	10

```
...  
\fill[opacity=0.3,purple] (9-4) circle (0.6) ;  
\fill[opacity=0.3,cyan] (6-6) circle (0.6) ;  
\draw[<->,very thick] (9-4) -- (6-6) ;
```

10	20	30	40	50	60	70	80	90	100
9	18	27	36	45	54	63	72	81	90
8	16	24	32	40	48	56	64	72	80
7	14	21	28	35	42	49	56	63	70
6	12	18	24	30	36	42	48	54	60
5	10	15	20	25	30	35	40	45	50
4	8	12	16	20	24	28	32	36	40
3	6	9	12	15	18	21	24	27	30
2	4	6	8	10	12	14	16	18	20
1	2	3	4	5	6	7	8	9	10

Documentation

- ▶ `pgfmanual.pdf`: <http://www.texample.net/media/pgf/builds/pgfmanualCVS2012-11-04.pdf>
- ▶ available tex sources: <http://www.texample.net/tikz/>
- ▶ in french: <http://math.et.info.free.fr/TikZ/bdd/TikZ-Impatient.pdf>