Write Convolutional Neural Networks using TikZ [closed]

Asked 10 months ago Active 10 months ago Viewed 565 times

0

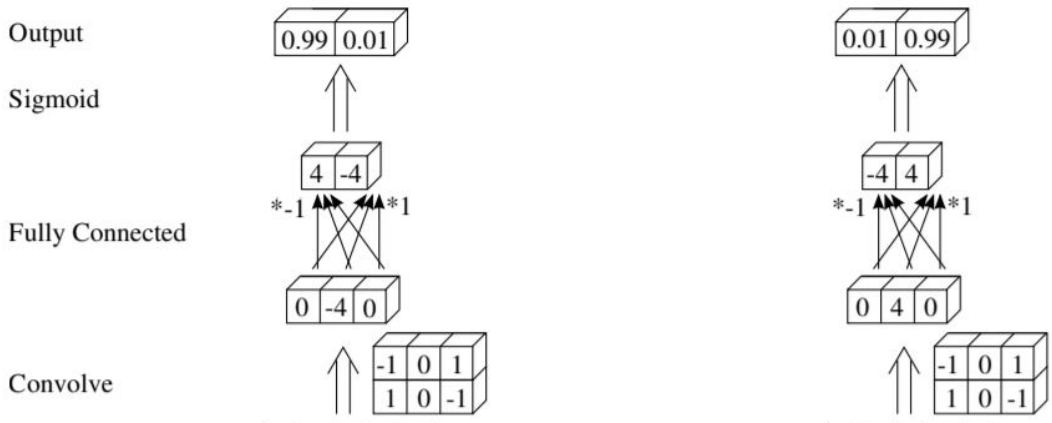
Closed. This question needs to be more focused. It is not currently accepting answers.

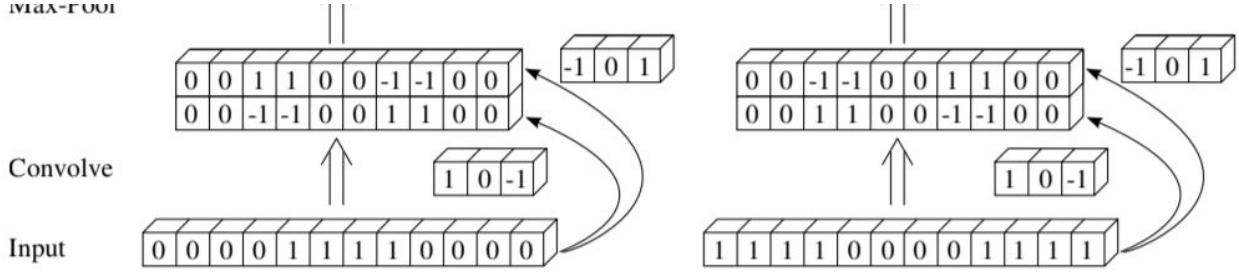
Want to improve this question? Update the question so it focuses on one problem only by editing this post.

Closed 11 months ago.

Improve this question

I would like to draw a CNN like this in the picture using TikZ any idea ?





tikz-pgf pdftex

asked Dec 4 '19 at 21:55

estamos
3 2

2 Welcome! The perhaps best way would be if you could try to contact this user and see if their package is ready. Without this package you could use the `matrix` library and use `execute at end matrix` to get the 3d effect. – user194703 Dec 4 '19 at 22:06

@Schrödinger's cat ty for the instant response can i find any template to base my work on or do i need to write it from scratch ? cool username btw :) – estamos Dec 4 '19 at 22:11

1 Answer

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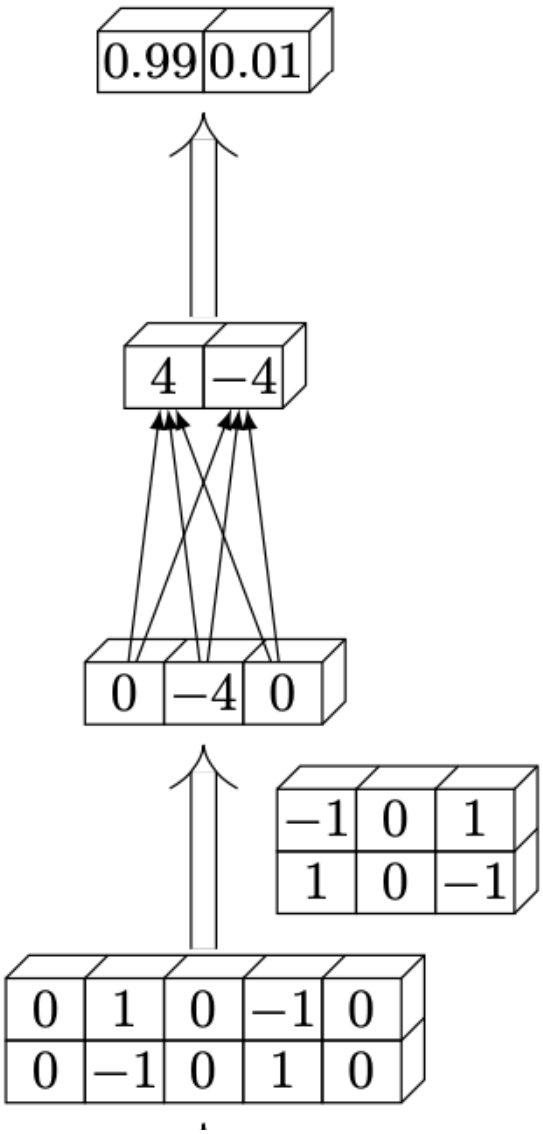
1

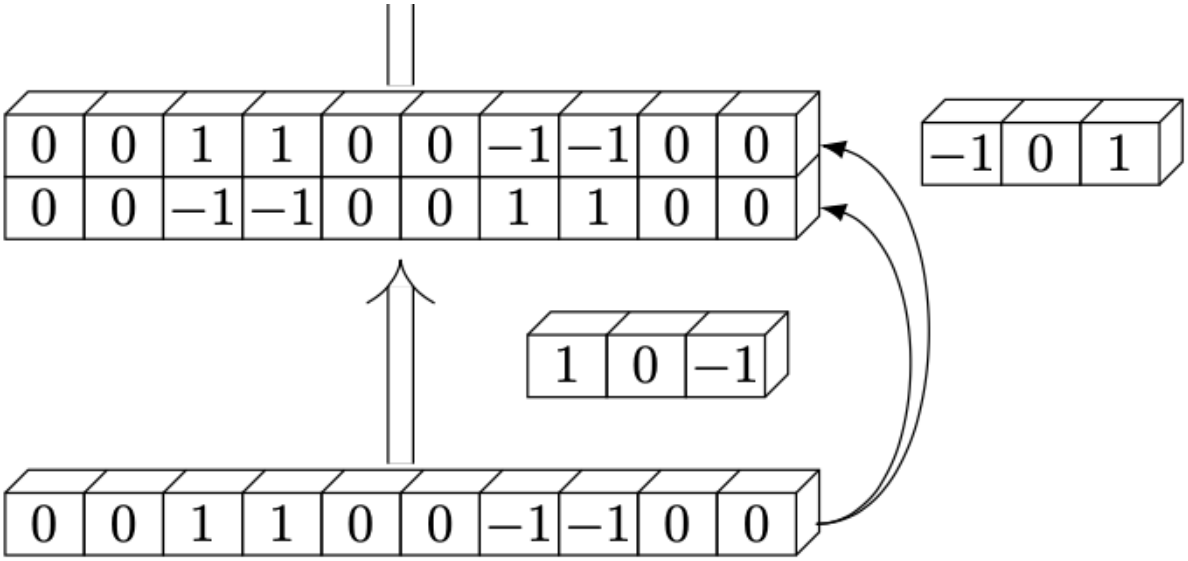
This is to give you a start (and not an attempt to fully reproduce the full screen shot). This answer comes with a style `3d matrix` that allows you to produce these blocks rather conveniently, you only need to fill in the entries. Please make sure that you give each matrix a different name, otherwise one matrix may inherit the block size from another matrix. (You also need to run the code twice.) I also show how one can draw arrows between matrices and specific elements.

```
\documentclass[tikz,border=3mm]{standalone}
\usepackage{eqparbox}
\usetikzlibrary{matrix,positioning,arrows.meta,bending}
\newbox\matrixcellbox
\tikzset{math center align per column/.style={nodes={execute at begin
 node={\setbox\matrixcellbox=\hbox\bgroup$},
 execute at end
 node={$\egroup\eqmakebox[\tikzmatrixname\the\pgfmatrixcurrentcolumn][c]
{\copy\matrixcellbox}}}},
 math center align per matrix/.style={nodes={execute at begin
 node={\setbox\matrixcellbox=\hbox\bgroup$},
 execute at end
 node={$\egroup\eqmakebox[\tikzmatrixname][c]{\copy\matrixcellbox}}}},
 3d matrix/.style={matrix of nodes,nodes in empty cells,math center align per
 matrix,nodes={draw,anchor=center,outer sep=0pt,inner sep=1pt,
 text height={height("\raisebox{0.2ex}{A}")},text depth={depth("g")}},
 column sep=-\pgflinewidth,row sep=-\pgflinewidth,execute at end matrix={
 \foreach \XX in {1,...,\the\pgfmatrixcurrentcolumn}
```

```
 {\draw (\tikzmatrixname-\XX-\the\pgfmatrixcurrentcolumn.south east) -- ++ (#1,#1);}
 \fi
 \draw (\tikzmatrixname-1-1.north west) -- ++ (#1,#1) --
  ([xshift=1ex,yshift=1ex]\tikzmatrixname-1-\the\pgfmatrixcurrentcolumn.north east) --
  ([xshift=1ex,yshift=1ex]\tikzmatrixname-\the\pgfmatrixcurrentrow-
\the\pgfmatrixcurrentcolumn.south east)  --
  (\tikzmatrixname-\the\pgfmatrixcurrentrow-\the\pgfmatrixcurrentcolumn.south east);
 }},3d matrix/.default=1ex,
 Rightarrow/.style={double,double
     distance=#1,>={Implies[bend]},shorten <=0.4ex},Rightarrow/.default=1ex}
\begin{document}
\begin{tikzpicture}[node distance=4em]
 \node[3d matrix] (mat1){
    0 & 0 & 1 & 1 & 0 & 0 & -1 & -1 & 0 & 0 \\
 };
 \node[3d matrix,above=of mat1] (mat2){
    0 & 0 & 1 & 1 & 0 & 0 & -1 & -1 & 0 & 0\\
    0 & 0 & -1 & -1 & 0 & 0 & 1 & 1 & 0 & 0\\
 };
 \node[3d matrix,above=of mat2] (mat3){
    0 & 1 & 0 & -1 & 0 \\

    0 & -1 & 0 & 1 & 0 \\
 };
 \node[3d matrix,above=of mat3] (mat4){ 0 & -4 & 0 \\};
 \node[3d matrix,above=of mat4] (mat5){ 4 & -4 \\};
 \node[3d matrix,above=of mat5] (mat6){ 0.99 & 0.01 \\};
 \draw[-{Latex[bend]}] (mat1.east) to[out=0,in=0]
  coordinate[near end](aux1) ([xshift=1ex]mat2-1-10.east);
 \path (aux1) node[right,above right,3d matrix]{-1 & 0 & 1\\};
 \draw[-{Latex[bend]}] (mat1.east) to[out=0,in=0] ([xshift=1ex]mat2-2-10.east);
 \draw[Rightarrow,->] (mat1) -- coordinate[midway,right=2em] (aux2) (mat2);
 \path (aux2) node[right,3d matrix] (mat1a){1 & 0 & -1 \\};
 \draw[Rightarrow,->] (mat2) -- (mat3);
 \draw[Rightarrow,->] (mat3) -- (mat4)
    coordinate[midway,right=1em] (aux3);
 \path (aux3) node[right,3d matrix] (mat3a){-1 & 0 & 1 \\
       1 & 0 & -1\\};
 \foreach \X in {1,2,3} {\foreach \Y in {1,2}
  {\draw[-latex] (mat4-1-\X) -- (mat5-1-\Y);}}
 \draw[Rightarrow,->] (mat5) -- (mat6);
\end{tikzpicture}
\end{document}
```





There is some issue when trying to add a matrix inside a the path construction. So I added coordinates along the path and use those to place the matrix.

edited Dec 5 '19 at 2:09 answered Dec 4 '19 at 22:57

user194703