

Paper Writing with LaTeX

What's the most resilient parasite?

An idea.



**A single idea from the human
mind can build cities.
An idea can transform the world
and rewrite all the rules.**

Writing Papers

=

Conveying Your Ideas

Writing **Good** Papers

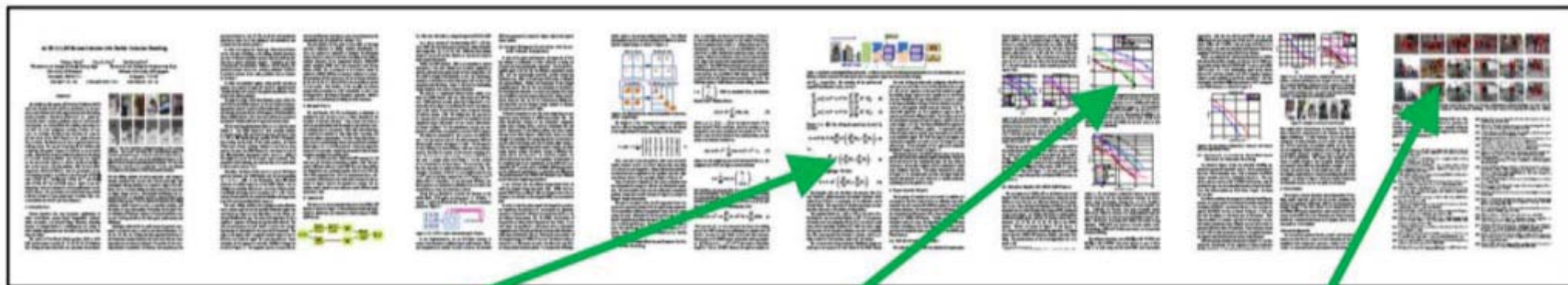
=

Conveying Your Ideas
Effectively

Learning to Review a paper



Characteristics of a “Good” paper



Math: Sophisticated mathematical expressions make a paper look technical and make the authors appear knowledgeable and “smart”.

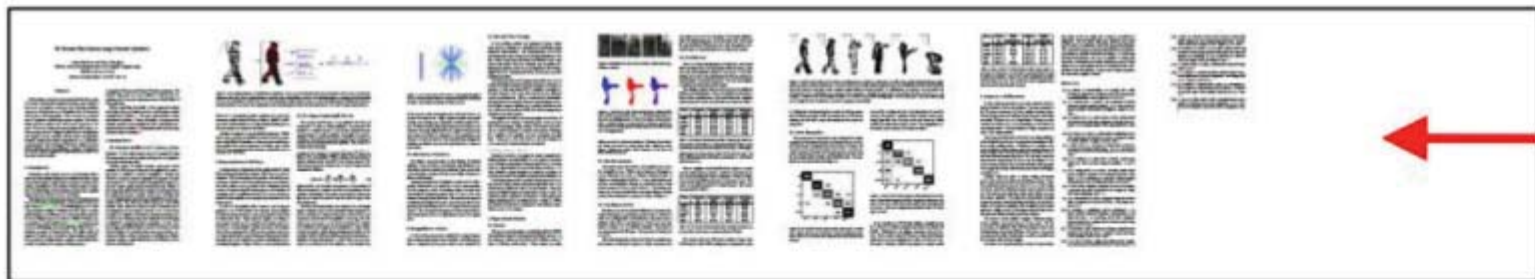
Plots: ROC, PR, and other performance plots convey a sense of thoroughness. Standard deviation bars are particularly pleasing to a scientific eye.

Figures/Screenshots: Illustrative figures that express complex algorithms in terms of 3rd grade visuals are always a must. Screenshots of anecdotal results are also very effective.

Characteristics of “Bad” papers



Large confusing tables.



Missing pages.



Lack of colorful figures.

This talk

- Share several useful guidelines for typesetting your paper with LaTeX
- Master the tool so you can maximize the clarity of your paper
- Crowdsource more tricks and best practices

Why LaTeX?

- Great typesetting tool (MS Word is *terrible* at this)
- Style and content separation
 - Easier to re-submit the rejected paper to somewhere else (?)
- No need to worry about the numbers of sections, figures, tables
- Beautiful math equations
- Reference management

Use the Correct Style File (.sty)

Which one do you want?

- **Manually format the paper, e.g.,**
All text must be in a two-column format. The total allowable width of the text area is 6 7/8 inches (17.5 cm) wide by 8 7 8 inches (22.54 cm) high. Columns are to be 3 1/4 inches (8.25 cm) wide, with a 5/16 inch (0.8 cm) space between them. The main title (on the first page) should begin 1.0 inch (2.54 cm) from the top edge of the page. The second and following pages should begin 1.0 inch (2.54 cm) from the top edge. On all pages, the bottom margin should be 1-1/8 inches (2.86 cm) from the bottom edge of the page for 8.5 × 11-inch paper; for A4 paper, approximately 1-5/8 inches (4.13 cm) from the bottom edge of the page. All printed material, including text, illustrations, and charts, must be kept within a print area 6-7/8 inches (17.5 cm) wide by 8-7/8 inches (22.54 cm) high.
- Or, just make sure that you use the correct style file

Version Control

- Version control platform

- [Git](#)
- [SVN](#)



- Online collaborative editors

- [Overleaf](#)
- [ShareLaTeX](#)



- Pros:
 - What-You-See-Is-What-You-Get platform
 - Real-time collaborative writing
- Cons: version control is not free

Example LaTeX Document

```
\documentclass[10pt,twocolumn,letterpaper]{article}
\include{macros}           % Pre-defined instructions
\usepackage{cvpr}         % CVPR style file (paper margin, font size, type)
\def\cvprPaperID{****}   % *** Enter the CVPR Paper ID here

\begin{document}

\title{My Awesome Paper Title}
\author{****}

% Paper content

\end{document}
```

Macros – Packages, Latin, and Math

- Commonly used packages

- Figures, algorithms, tables, list, math, fonts, comments, hyperlinks
- See an example [here](#)

- Latin abbreviations

- `\def\etal{et~al._}` % **and others, and co-workers**
- `\def\eg{e.g.,~}` % **for example**
- `\def\ie{i.e.,~}` % **that is, in other words**
- `\def\etc{etc}` % **and other things, and so forth**
- `\def\cf{cf.~}` % **compare**
- `\def\viz{viz.~}` % **namely, precisely**
- `\def\vs{vs.~}` % **against**

- Math related

- `\DeclareMathOperator*{\argmin}{\arg\!\min}`
- `\DeclareMathOperator*{\argmax}{\arg\!\max}`

Macros - References for figures, tables, equations, and sections

```
\newcommand{\secref}[1]{Section~\ref{sec:#1}}
\newcommand{\figref}[1]{Figure~\ref{fig:#1}}
\newcommand{\tabref}[1]{Table~\ref{tab:#1}}
\newcommand{\eqnref}[1]{\eqref{eq:#1}}
\newcommand{\thmref}[1]{Theorem~\ref{#1}}
\newcommand{\prgref}[1]{Program~\ref{#1}}
\newcommand{\algrf}[1]{Algorithm~\ref{#1}}
\newcommand{\clmref}[1]{Claim~\ref{#1}}
\newcommand{\lemref}[1]{Lemma~\ref{#1}}
\newcommand{\ptyref}[1]{Property~\ref{#1}}
```

```
\section{Overview}
\label{sec:overview}
...
Section~\secref{overview}
describes XXX
...
```

DO NOT manually set the section, figure, table numbers!

Macros – Short-hand notations

Define commonly used notations

- `\newcommand{\tb}[1]{\textbf{#1}}`
- `\newcommand{\mb}[1]{\mathbf{#1}}`
- `\newcommand{\Paragraph}[1]{\noindent\textbf{#1}}`
- `\def\ith{i^{\textit{th}}}`

DO NOT type the same symbol more than twice
-> Poor readability, error-prone, difficult to revise

```
Let  $\mathbf{p}_x^k$ ,  
 $\mathbf{p}_y^k$ ,  
 $\mathbf{p}_z^k$  be the ...
```

```
\begin{equation}  
\mathbf{p}_z^k = \mathbf{p}_x^k  
+ \mathbf{p}_y^k  
\end{equation}
```



```
\def\px{\mathbf{p}_x^k}  
\def\py{\mathbf{p}_y^k}  
\def\pz{\mathbf{p}_z^k}
```

```
...  
Let  $\px$ ,  $\py$ ,  $\pz$  be the ...
```

```
\begin{equation}  
\pz = \px + \py  
\end{equation}
```

Macros – Comments, To-Do, Revision

In-text comments

- `\newcommand{\jiabin}[1]{\color{blue}\textbf{Jia-Bin:} #1}\normalfont}`

To-Do items

- `\newcommand{\todo}{\textbf{\color{red}[TO-DO] _}}`

Added new texts

- `\def\newtext#1{\textcolor{blue}{#1}}`

Modified texts

- `\def\modtext#1{\textcolor{red}{#1}}`

Ignore texts

- `\def\ignorethis#1{}`

Macros – Quickly remove comments

Three easy steps for removing all in-text comments

- **Step 1: Include required package** `\usepackage{ifthen}`
- **Step 2: Put** `\newcommand{\final}{1}` **right below**
`\documentclass`
- **Step 3: Renew commands if the draft is final**
`\ifthenelse{\equal{\final}{1}}
{
 \renewcommand{\todo}[1]{}
 \renewcommand{\jiabin}[1]{}
}
{}`

Sections

```
\section{Introduction}
```

```
\section{Related Work}
```

```
\section{Overview}
```

```
\section{Method}
```

```
\section{Experimental Results}
```

```
\section{Conclusions}
```

- **DO** add labels to all sections

```
\section{Overview}
```

```
\label{sec:overview}
```

- **DO** use informative section names to replace “Method/Algorithm”

- `\section{Method}`

->

```
\section{Completion as  
Optimization}
```

Subsections

```
\section{Algorithm XXX}
```

```
\label{sec:algorithm}
```

```
\subsection{Problem formulation}
```

```
\label{sec:problem}
```

```
\subsection{Objective function}
```

```
\label{sec:objective}
```

```
\subsection{Optimization}
```

```
\label{sec:optimization}
```

- **DO** add labels to all subsections

```
\subsection{Objective function}
```

```
\label{sec:objective}
```

- For sections, I cap the first letter for every word

```
\section{Experimental Results}
```

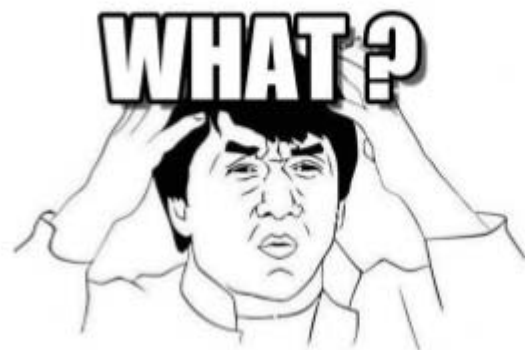
- For subsections, I cap ONLY the first letter of the first word

```
\subsection{Implementation  
details}
```

Subsubsections

```
\subsubsection{XXX}
```

- 4.1.3 Dataset A
- 4.2.5 Dataset B
- 4.3.1 Metrics
- 4.3.4 Run-time
- 4.5.2 Results on dataset A
- 4.5.3 Results on dataset B



- **DO NOT** use subsubsections
 - Too confusing

- **DO** use `\paragraph`

```
\subsection{Datasets}
\paragraph{Dataset A}
\paragraph{Dataset B}
\paragraph{Metrics}
```

```
\subsection{Implementation details}
\paragraph{Run-time}
```

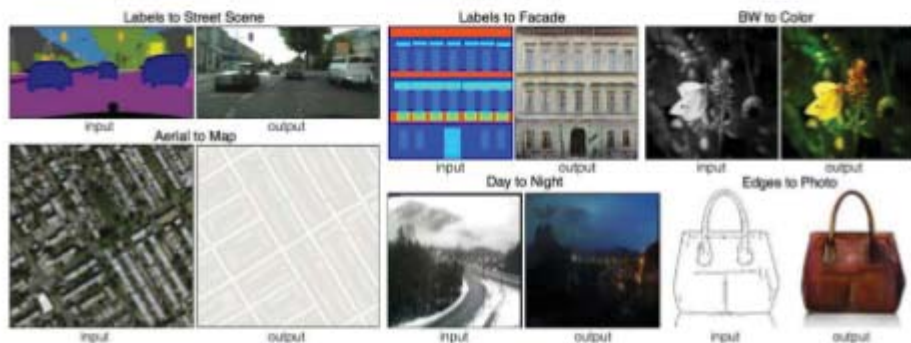
```
\subsection{Results}
\paragraph{Results on dataset A}
\paragraph{Results on dataset B}
```

Organize your files

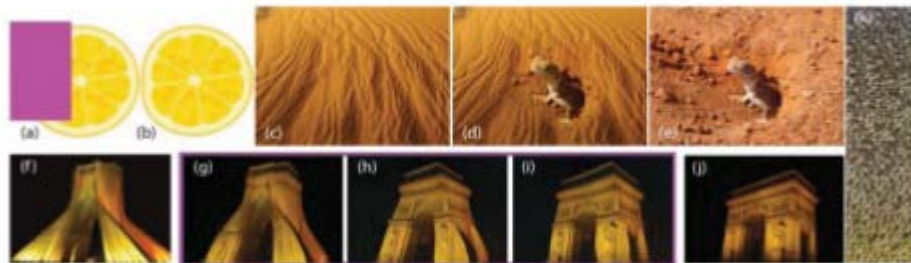
- Move figures to separate folders
- Use one tex file for each figure, table, and algorithm
 - Leave the `main.tex` with only main texts
 - Help focus on finetuning each figure
 - Avoid copying and pasting an entire block of tables/figures
- Use `\input{FILE_NAME}` to include the file to the main paper
 - `\input{figures/teaser}`
 - `\input{figures/overview}`
- (Optional) Use one tex file for each major section
 - Avoid merge/commit conflicts

Figures – Teaser

- Show off the strongest results (**Input** and **Output**)



[Isola et al 2017]



[Darabi et al. 2012]



[Zhang et al 2016]

[Huang et al 2016]

Figures – Motivation

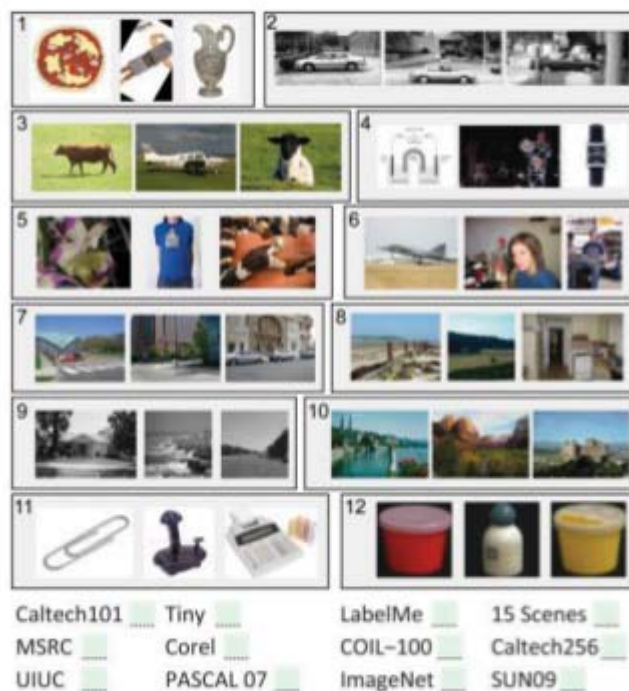
- Examples that highlight the **Key Idea** of the paper



[Huang et al. 2015]



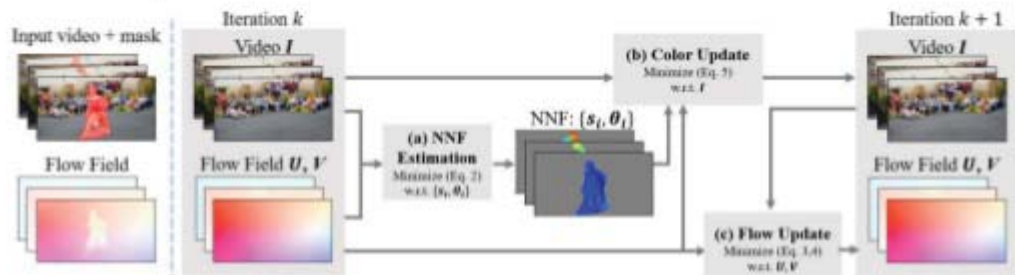
[Parikh and Grauman 2011]



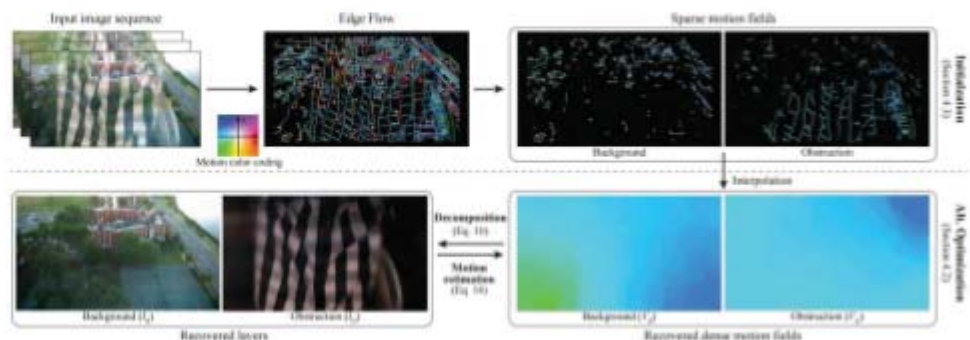
[Torralba and Efros 2011]

Figures – Overview

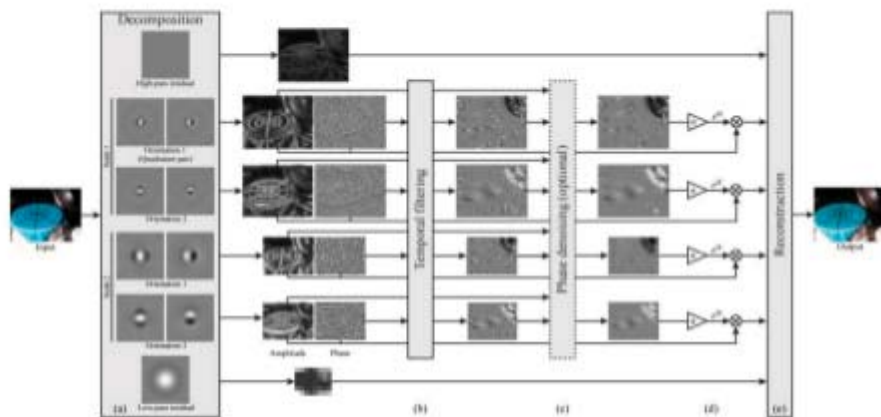
- Visualize the **algorithm**
- Provide forward references to equations and sections



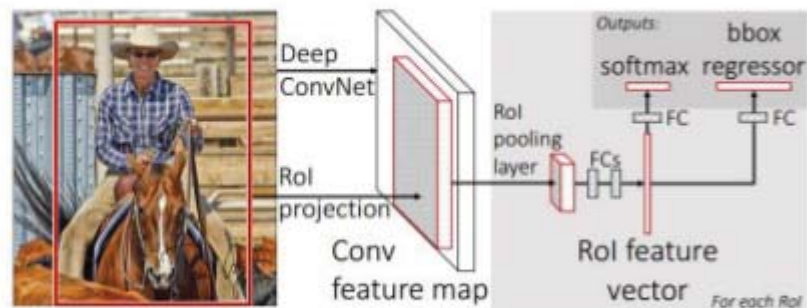
[Huang et al. 2016]



[Xue et al. 2015]



[Wadhwa et al. 2013]



[Girshick 2015]

Figures

- File format
 - DO NOT use JPEG images (to avoid compression artifacts). Use PNG or PDF
- Resolution
 - DO NOT use low-resolution images
- Position
 - Put the figures to the top of each page `\begin{figure} [t]`
- Caption
 - The image caption should be self-contained
 - Highlight the topic of the figure with **bold font**
`\textbf`

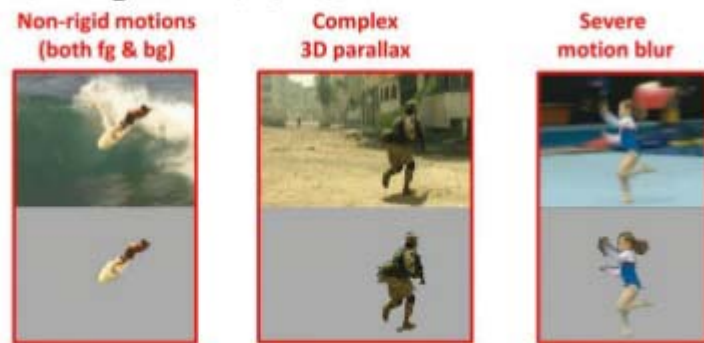


Figure 1: A unified approach to fg/bg video segmentation in *unconstrained* videos. Our algorithm can handle in a single framework video sequences which contain highly non-rigid foreground and background motions, complex 3D parallax and simple 2D motions, and severe motion blur.

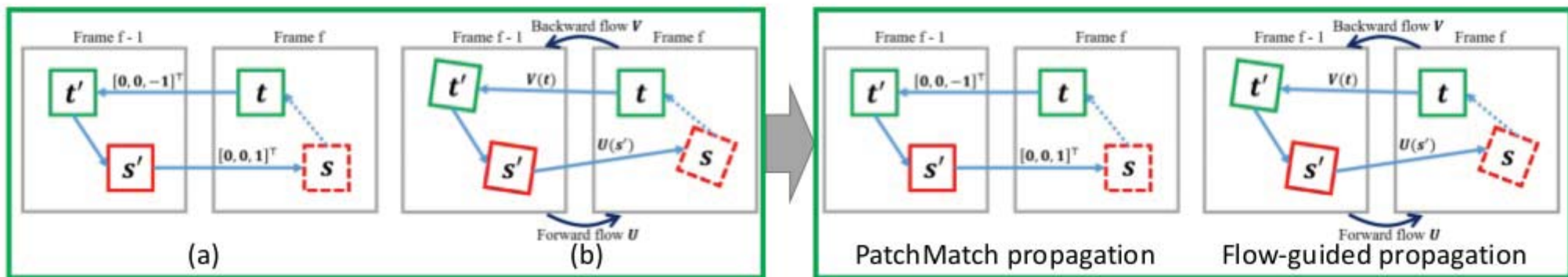
[Faktor and Irani 2014]

Multiple Images

- Use `subfigure` or `minipage`. **DO NOT** use `tabular`.
- **Never manually define the physical size of the image**
 - `\includegraphics[width=5cm]{IMAGE.png}` -> **Bad**
 - `\includegraphics[width=0.5\linewidth]{IMAGE.png}` -> **Good**
 - `\setlength{\figwidth}{0.5\linewidth}` -> **Best**
`\begin{minipage}{\figwidth}`
`\includegraphics[width=\linewidth]{IMAGE.png}`
`\end{minipage}`

Multiple Images

- Put sub-captions directly under subfigures, do not put them in the caption



[Huang et al. 2016]

- All the legends, axis, labels must be clearly visible
- Make use of color and textures to code information

Spacing between Images

```
\begin{figure} [t]
% Maximum length
\includegraphics [width=0.3\linewidth] {A.png} \hfill
\includegraphics [width=0.3\linewidth] {A.png}

% Equal length
\hspace*{\fill}
\includegraphics [width=0.3\linewidth] {B.png} \hfill
\includegraphics [width=0.3\linewidth] {B.png}
\hspace*{\fill}

% Fixed length
\centering
\includegraphics [width=0.3\linewidth] {C.png} \hspace{1em}
\includegraphics [width=0.3\linewidth] {C.png}
\end{figure}
```



(a) 1a



(b) 1b



(c) 2a



(d) 2b



(e) 3a



(f) 3b

TikZ package

```
\usepackage{tikz}  
\begin{tikzpicture}  
code  
\end{tikzpicture}
```

Tutorial: [A very minimal introduction to TikZ](#) by [Jacques Crémer](#) (TSE)

Tools for converting your figures to TikZ figures

- [MATLAB](#)
- [Python](#)

Image, video, and dataset names

- Use `\textsc{Name}` to separate images, videos, dataset names from the main texts.



DOWNHILL SKIING



MOUNTAIN BIKING



KAYAKING



SANTIAGO MARKET WALK



CABLE CAR



CITY BIKING



PIKE MARKET WALK



TODDLER

[Kopf 2016]

Multiple Images

- How do I align images with different sizes?
 - Solve a simple algebra problem
- Suppose we know the image on the left has aspect ratio = $H/W = c$
 - What's x ?



$$cx = 2(1 - x)$$

$$(2 + c)x = 2$$

$$x = 2/(2 + c)$$

```
\setlength{\figa}{0.612\textwidth}  
\setlength{\figb}{0.388\textwidth}
```

```
\begin{minipage}{\figa}  
\includegraphics[width=\linewidth]{ImA.png}  
\end{minipage}  
\begin{minipage}{\figb}  
\includegraphics[width=\linewidth]{ImB.png}  
\includegraphics[width=\linewidth]{ImB.png}  
\end{minipage}
```

Tables – Basics

```
\begin{table}[t]
\caption{Table caption} % Table captions are ABOVE the table
\label{tab:table_name} % Always label the table

\begin{tabular}{clr} % c: center, l: left, r: right
XX & XX & XX \\
YY & YY & YY
\end{tabular}

\end{table}
```

[User-friendly LaTeX table generator](#) (recommended by [Ting-Hao Kenneth Huang](#))

Tables – Comparison to related work

- Provide conceptual differences to related work

Method	No bottleneck required	Uses input dropout	No domain gap	No input handicap
Autoencoder [15]	×	×	✓	✓
Denoising autoencoder [36]	✓	✓	×	✓
Context Encoder [28]	✓	✓	×	✓
Cross-Channel Encoder [42]	✓	✓	✓	×
Split-Brain Autoencoder	✓	✓	✓	✓

[Zhang et al 2017]

Dataset	Levin et al. [17]	Sun et al. [38]	Köhler et al. [13]	Ours (real)	Ours (synthetic)
Synthetic/Real	Synthetic	Synthetic	Real	Real	Synthetic
Blur Model	Uniform	Uniform	Non-uniform	Unknown	Both
Latent Images	4	80	4	100	25
Kernels / Trajectories	8	8	12	100	8
Blurred Images	32	640	48	100	200
Depth variation	No	No	No	Yes	No
Evaluation	PSNR/SSIM	PSNR/SSIM	PSNR	User study	User study

[Lai et al 2016]

Tables – Results

- Highlight the **best** and the second best results
- Group methods that use different training sets or different levels of supervision
- Always provide citation for each method
- If you have a big table, use

```
\resizebox{\textwidth}{!}{
\begin{tabular}
...
\end{tabular}
}
```

Algorithm	Scale	SET5	SET14	BSDS100	URBAN100	MANGA109
		PSNR / SSIM / IFC	PSNR / SSIM / IFC	PSNR / SSIM / IFC	PSNR / SSIM / IFC	PSNR / SSIM / IFC
Bicubic	2	33.65 / 0.930 / 6.166	30.34 / 0.870 / 6.126	29.56 / 0.844 / 5.695	26.88 / 0.841 / 6.319	30.84 / 0.935 / 6.214
A+ [28]	2	36.54 / 0.954 / <u>8.715</u>	32.40 / 0.906 / <u>8.201</u>	31.22 / 0.887 / <u>7.464</u>	29.23 / 0.894 / 8.440	35.33 / 0.967 / 8.906
SRCNN [7]	2	36.65 / 0.954 / 8.165	32.29 / 0.903 / 7.829	31.36 / 0.888 / 7.242	29.52 / 0.895 / 8.092	35.72 / 0.968 / 8.471
FSRCNN [8]	2	36.99 / 0.955 / 8.200	32.73 / 0.909 / 7.843	31.51 / 0.891 / 7.180	29.87 / 0.901 / 8.131	36.62 / 0.971 / 8.587
SelfExSR [15]	2	36.49 / 0.954 / 8.391	32.44 / 0.906 / 8.014	31.18 / 0.886 / 7.239	29.54 / 0.897 / 8.414	35.78 / 0.968 / 8.721
RFL [24]	2	36.55 / 0.954 / 8.006	32.36 / 0.905 / 7.684	31.16 / 0.885 / 6.930	29.13 / 0.891 / 7.840	35.08 / 0.966 / 8.921
SCN [31]	2	36.52 / 0.953 / 7.358	32.42 / 0.904 / 7.085	31.24 / 0.884 / 6.500	29.50 / 0.896 / 7.324	35.47 / 0.966 / 7.601
VDSR [16]	2	<u>37.53</u> / <u>0.958</u> / 8.190	32.97 / <u>0.913</u> / 7.878	<u>31.90</u> / <u>0.896</u> / 7.169	<u>30.77</u> / <u>0.914</u> / 8.270	37.16 / <u>0.974</u> / 9.120
DRCN [17]	2	<u>37.63</u> / <u>0.959</u> / 8.326	<u>32.98</u> / <u>0.913</u> / 8.025	<u>31.85</u> / <u>0.894</u> / 7.220	<u>30.76</u> / <u>0.913</u> / <u>8.527</u>	<u>37.57</u> / 0.973 / <u>9.541</u>
LapSRN (ours)	2	37.43 / 0.958 / <u>8.999</u>	<u>33.05</u> / 0.912 / <u>8.497</u>	31.77 / 0.894 / <u>7.716</u>	30.36 / 0.909 / <u>8.898</u>	<u>37.23</u> / <u>0.973</u> / <u>9.482</u>
Bicubic	4	28.42 / 0.810 / 2.337	26.10 / 0.704 / 2.246	25.96 / 0.669 / 1.993	23.15 / 0.659 / 2.386	24.92 / 0.789 / 2.289
A+ [28]	4	30.30 / 0.859 / 3.260	27.43 / 0.752 / 2.961	26.82 / 0.710 / 2.564	24.34 / 0.720 / 3.218	27.02 / 0.850 / 3.177
SRCNN [7]	4	30.49 / 0.862 / 2.997	27.61 / 0.754 / 2.767	26.91 / 0.712 / 2.412	24.53 / 0.724 / 2.992	27.66 / 0.858 / 3.045
FSRCNN [8]	4	30.71 / 0.865 / 2.994	27.70 / 0.756 / 2.723	26.97 / 0.714 / 2.370	24.61 / 0.727 / 2.916	27.89 / 0.859 / 2.950
SelfExSR [15]	4	30.33 / 0.861 / 3.249	27.54 / 0.756 / 2.952	26.84 / 0.712 / 2.512	24.82 / 0.740 / 3.381	27.82 / 0.865 / 3.358
RFL [24]	4	30.15 / 0.853 / 3.135	27.33 / 0.748 / 2.853	26.75 / 0.707 / 2.455	24.20 / 0.711 / 3.000	26.80 / 0.840 / 3.055
SCN [31]	4	30.39 / 0.862 / 2.911	27.48 / 0.751 / 2.651	26.87 / 0.710 / 2.309	24.52 / 0.725 / 2.861	27.39 / 0.856 / 2.889
VDSR [16]	4	31.35 / 0.882 / 3.496	28.03 / <u>0.770</u> / <u>3.071</u>	<u>27.29</u> / <u>0.726</u> / <u>2.627</u>	<u>25.18</u> / <u>0.753</u> / 3.405	28.82 / 0.886 / 3.664
DRCN [17]	4	<u>31.53</u> / <u>0.884</u> / <u>3.502</u>	<u>28.04</u> / 0.770 / 3.066	27.24 / 0.724 / 2.587	25.14 / 0.752 / <u>3.412</u>	<u>28.97</u> / <u>0.886</u> / <u>3.674</u>
LapSRN (ours)	4	<u>31.52</u> / <u>0.884</u> / <u>3.559</u>	<u>28.18</u> / <u>0.771</u> / <u>3.147</u>	<u>27.31</u> / <u>0.727</u> / <u>2.677</u>	<u>25.21</u> / <u>0.755</u> / <u>3.530</u>	<u>29.08</u> / <u>0.889</u> / <u>3.729</u>

Tables – Making nice tables

- Which one looks better?

signal processing concept	algebraic concept (coordinate free)	in coordinates
filter signal filtering impulse impulse response of $h \in \mathcal{A}$	$h \in \mathcal{A}$ (algebra) $s = \sum s_i b_i \in \mathcal{M}$ (\mathcal{A} -module) $h \cdot s$ base vector $b_i \in \mathcal{M}$ $h \cdot b_i \in \mathcal{M}$	$\phi(h) \in \mathbb{C}^{I \times I}$ $\mathbf{s} = (s_i)_{i \in I} \in \mathbb{C}^I$ $\phi(h) \cdot \mathbf{s}$ $\mathbf{b}_i = (\dots, 0, 1, 0, \dots)^T \in \mathbb{C}^I$ $\phi(h) \cdot \mathbf{b}_i = (\dots, h_{-1}, h_0, h_1, \dots)^T \in \mathbb{C}^I$
Fourier transform spectrum of signal frequency response of $h \in \mathcal{A}$	$\Delta: \mathcal{M} \rightarrow \bigoplus_{\omega \in W} \mathcal{M}_\omega$ $\Delta(s) = (s_\omega)_{\omega \in W} = \omega \mapsto s_\omega$	$\mathcal{F}: \mathbb{C}^I \rightarrow \bigoplus_{\omega \in W} \mathbb{C}^{d_\omega}$ $\Leftrightarrow \phi \rightarrow \bigoplus_{\omega \in W} \phi_\omega$ $\mathcal{F}(\mathbf{s}) = (\mathbf{s}_\omega)_{\omega \in W} = \omega \mapsto \mathbf{s}_\omega$ $(\phi_\omega(h))_{\omega \in W} = \omega \mapsto \phi_\omega(h)$

signal processing concept	algebraic concept (coordinate free)	in coordinates
filter	$h \in \mathcal{A}$ (algebra)	$\phi(h) \in \mathbb{C}^{I \times I}$
signal	$s = \sum s_i b_i \in \mathcal{M}$ (\mathcal{A} -module)	$\mathbf{s} = (s_i)_{i \in I} \in \mathbb{C}^I$
filtering	$h \cdot s$	$\phi(h) \cdot \mathbf{s}$
impulse	base vector $b_i \in \mathcal{M}$	$\mathbf{b}_i = (\dots, 0, 1, 0, \dots)^T \in \mathbb{C}^I$
impulse response of $h \in \mathcal{A}$	$h \cdot b_i \in \mathcal{M}$	$\phi(h) \cdot \mathbf{b}_i = (\dots, h_{-1}, h_0, h_1, \dots)^T \in \mathbb{C}^I$
Fourier transform	$\Delta: \mathcal{M} \rightarrow \bigoplus_{\omega \in W} \mathcal{M}_\omega$	$\mathcal{F}: \mathbb{C}^I \rightarrow \bigoplus_{\omega \in W} \mathbb{C}^{d_\omega} \Leftrightarrow \phi \rightarrow \bigoplus_{\omega \in W} \phi_\omega$
spectrum of signal	$\Delta(s) = (s_\omega)_{\omega \in W} = \omega \mapsto s_\omega$	$\mathcal{F}(\mathbf{s}) = (\mathbf{s}_\omega)_{\omega \in W} = \omega \mapsto \mathbf{s}_\omega$
frequency response of $h \in \mathcal{A}$	n.a.	$(\phi_\omega(h))_{\omega \in W} = \omega \mapsto \phi_\omega(h)$

Source: [Small Guide to Making Nice Tables](#) by [Markus Püschel](#) (ETH Zürich)

Recommended by [David J. Crandall](#)

Algorithms

- See the documentation of [algorithm2e](#)
- Provide the main steps of the algorithm
- Use consistent annotations
- Use references to sections and equations to connect the main texts with the algorithm

Algorithm 1: Proposed video completion algorithm.

Input : Video I , user-specified mask $\bar{\Omega}$

Output: Completed video I

```
1 Compute forward/backward flow fields  $U, V$  in  $\Omega$ 
2 Initialization: filling hole  $\bar{\Omega}$  in  $I, U, V$  at coarsest scale (Sec. 4.4)
3 for scale  $s$  from 1 to  $n_s$  do
4   for iteration  $k$  from 1 to  $K_s$  do
5     (a) NNF estimation:
6     Minimize Eq. 2 w.r.t.  $\{s_i, \theta_i\}$ , with  $I, U, V$  fixed.
7     (b) Color update:
8     Minimize Eq. 5 w.r.t.  $I$ , with  $U, V, \{s_i, \theta_i\}$  fixed.
9     (c) Flow update:
10    Minimize Eqs. 3 and 4 w.r.t.  $U, V$ , with  $I, \{s_i, \theta_i\}$  fixed.
11   end
12   Upsample  $U, V$  using bicubic interpolation.
13   Upsample  $\{s_i, \theta\}$  using nearest-neighbor interpolation.
14 end
```

Equations

- Use `\begin{equation}...\end{equation}` environment.
- Use `\begin{align} ... \end{align}` if you have multiple lines of equations
- Label every equation `\label{eqn:Eqn-Name}`
- For in-text math symbols, use `$$`, e.g. Let x be ...
- Define every notation
- For texts that are not part of the equation, use `\mathrm`, e.g. x_{color}

Equations

- Number all equations
 - Easy to refer to them
- Equations are grammatical parts of the sentences
 - Never forget a period after an equation
 - Never create a dangling displayed equation
- Negative numbers
 - “-” indicate the dash. Use $\$-1\$$ to represent minus one
- Angle brackets
 - Use `\langle` and `\rangle`, instead of the comparison operators `<` and `>`
- Big parentheses
 - Use `\left` and `\right` for automatic resizing round `()`, square `[]`, and angled `\langle\rangle` brackets as well as vertical bars `\vert` and `\Vert`

Dashes

- hyphen (-, produced with one dash –)
 - interword dashes
 - E.g., non-negligible
- en-dash (–, produced with two dashes --)
 - indicate an opposition or relationship
 - e.g., mass--energy equivalence → “mass–energy equivalence”
 - Pages
 - e.g., as seen on pages 17--30 → “as seen in on pages 17–30”
- em-dash (—, produced with three dashes ---)
 - denote a break in a sentence or to set off parenthetical statements
 - e.g., A flock of sparrows – some of them juveniles – flew overhead

References

- Paper title:

- Use correct capital letter, e.g., ImageNet -> Image{N}et
- The first letter after ``:`" should be capital, e.g., DeepPose: Human pose estimation ... -> Deep{P}ose: {H}uman pose estimation ...

- Authors:

- Make sure that you use ``{}" for special letters, e.g., Durand, Fr{\`e}do.

- Journal papers

- Fill in authors, title, journal, volume, number, pages, year.

Conference papers

- Only fill in authors, title, booktitle, and year.
- Do not fill in volume, number, page, and publisher.

References

- Journal/conference venue:

- Use the pre-defined string

```
@string { ICCV = "International Conference on Computer Vision" }  
booktitle = ICCV
```

- Be consistent

- Do not use "IEEE Transactions on Pattern Analysis and Machine Intelligence", "Pattern Analysis and Machine Intelligence, IEEE Transactions on", "IEEE Trans. PAMI", "TPAMI" at the same time. Using the pre-defined strings can help avoid this issue.

- Label:

- Recommended naming convention: Last name of the first author-Publication-Year, e.g., Huang-CVPR-2015.

References

- Avoid multiple entries of the same paper
- Find the correct venue where the paper was published
 - Do not use arXiv for every paper
- Manage the references
 - Group the papers into different categories

Citations

- Do not use citations as nouns
 - If you remove all parenthetical citations from the paper, you should still have complete, grammatically correct sentences
 - “As shown in [1]” -> “As shown by XXX et al. [1]”
 - No “[1] present XXX...”
- Spacing
 - Use a non-breaking space “~” between a citation and the preceding word in the sentence: “Path tracing~\cite{Kajiya:86} is...”.
- Multiple citations
 - Use `\cite{key1, key2}`
 - Do not use `\cite{key1} \cite{key2}`

Fit your paper into the page limit

Step 1. Use consistent lengths for reducing margins

```
\newlength\secmargin  
\newlength\paramargin  
\newlength\figmargin  
  
\setlength{\secmargin}{-1.0mm}  
\setlength{\paramargin}{-2.0mm}  
\setlength{\figmargin}{-3.0mm}
```



Step 2. Apply the `vspace` to the corresponding positions

```
\vspace{\secmargin} \vspace{\paramargin} \vspace{\figmargin}
```

Step 3. Adjust baseline

```
\renewcommand{\baselinestretch}{0.998}
```

Better tool than LaTeX?

- <https://www.authorea.com/>



The screenshot shows the Authorea editor interface. At the top, there's a navigation bar with 'Title', 'Citation tool', and 'Format' tabs. Below the navigation bar, the document content is displayed. The main heading is 'HOW TO WRITE LATEX IN AUTHOREA' in large, bold, white letters on a dark background. The text below the heading is a detailed explanation of the Authorea workflow, comparing it to traditional LaTeX editors and highlighting its modular, content-free format. The Authorea logo is visible in the bottom right corner of the editor window.

The screenshot shows the Authorea editor interface with a document titled 'Introduction'. The main text area contains a numbered list of seven points explaining the Authorea workflow and its advantages over traditional LaTeX editors. The text is as follows:

- 1 If you are used to writing in LaTeX, you will notice that Authorea is not your typical LaTeX editor. The big difference with other editors is that Authorea compiles LaTeX (and other markup languages) to HTML. Of course, you can still download a PDF version of your paper formatted according to your journal of choice at any time. In fact, since on Authorea you don't need to specify styles, classes, or packages, you get to focus on the content and you can then export your paper in the format you like in just one click.
- 2
- 3 In a traditional LaTeX editor, you work on the raw LaTeX source and free time to time you compile the `{verb}` .tex file to see the results in a PDF. `\href{https://twitter.com/authorea/status/373112928529305681/photo/1}{Compiling LaTeX can be a pain in the neck, right?}` Especially when you have spent hours formatting the paper in a format and then learn you have to reformat it for another journal. Authorea prevents all that. It separates content free form.
- 4
- 5 Every Authorea article is modular: it is composed of individual modules which can be text blocks and figures, for example. A text block, whether it is written in LaTeX, Markdown, HTML (and many more formats coming soon!) will just render to the web - no need to compile it. The post you are reading, which was written on Authorea, is composed of several text blocks and figures. Click on the Index button above to visualize them.
- 6
- 7 If you are a co-author on an Authorea document, you have authoring privileges which means that you can modify any element, remove it and add new ones. For example, if you had authoring privileges on the post you are reading, you would be able to double click here and the editor window pictured below would open up.

Optional: Type here a short summary of your changes

Commit message: **what did you change?**

Saved in browser cache

Save and commit

Resources on Writing

- [Awesome computer vision – writing](#) by [Jia-Bin Huang](#) (Virginia Tech)
- [A quick guide to LaTeX](#) by [Dave Richeson](#) (Dickinson College)
- [Common mistakes in technical writing](#) by [Wojciech Jarosz](#) (Dartmouth College)
- [SIGGRAPH paper template](#) by [Li-Yi Wei](#) (University of Hong Kong)
- [Notes on writing](#) by [Fredo Durand](#) (MIT)
- [How to write a good CVPR submission](#) by [Bill Freeman](#) (MIT)
- [How to write a great research paper](#) by [Simon Peyton Jones](#) (MSR)
- [How to write papers so people can read them](#) by [Derek Dreyer](#) (MPI)

Thank You!