



Introduction to Scientific Working

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Keywords

acknowledgement awards beamer bibliography CORE ranking DBLP
conference editorial board generative AI Google Scholar h-index impact factor
journal \LaTeX LIPIcs LNCS open access plagiarism presentation
program committee rebuttal review submission TikZ workshop ...

Types of Scientific Works

- ▶ seminar report
- ▶ bachelor thesis
- ▶ master thesis
- ▶ PhD thesis
- ▶ habilitation thesis
- ▶ workshop paper
- ▶ conference paper
- ▶ journal article
- ▶ book chapter
- ▶ book

Outline

1. TikZ
2. Journals
3. LaTeX
4. DOI and ORCID
5. Homework

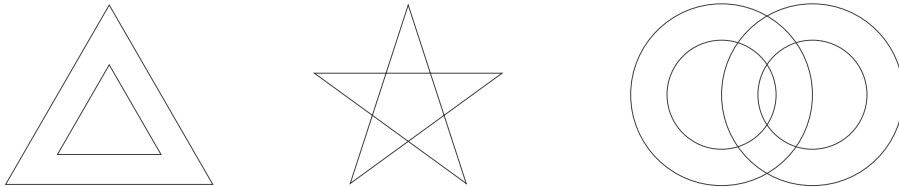
Outline

1. TikZ
2. Journals
3. LaTeX
4. DOI and ORCID
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Paths and Filling

```
\usetikzlibrary{scopes}
\draw (90:2) -- (210:2) -- (330:2) -- cycle
      (90:1) -- (330:1) -- (210:1) -- cycle;
{ [shift={(5cm,3.5mm)}, scale=1.65]
  \draw (90:1) -- (234:1) -- (18:1) -- (162:1) -- (306:1) -- cycle; }
{ [shift={(11cm,5mm)}, scale=0.76]
  \draw (-1,0) circle (1.2) (-1,0) circle (2);
  \draw (1,0) circle (1.2) (1,0) circle (2); }
```

src



Path Interior: Nonzero Rule

to determine whether point is outside or inside:

- ▶ consider ray from point toward infinity in any direction
- ▶ set counter to zero
- ▶ each time ray crosses path
 - ▶ increment counter if path goes from left to right
 - ▶ decrement counter if path goes from right to left
- ▶ point is outside (inside) if counter is zero (nonzero)

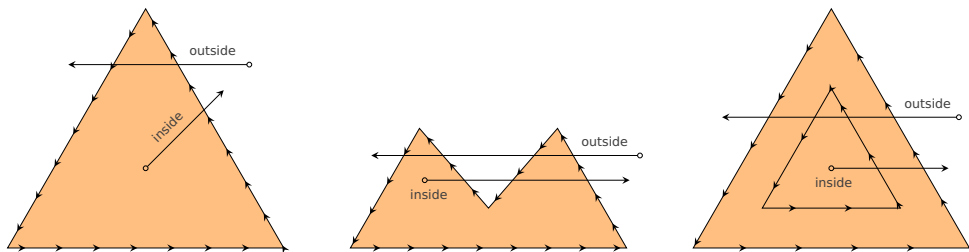
Path Interior: Even Odd Rule

to determine whether point is outside or inside:

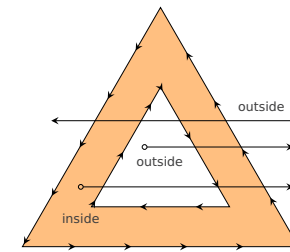
- ▶ count how often ray crosses path
- ▶ point is outside (inside) if count is even (odd)

```
\filldraw[orange!50] (90:2) -- (210:2) -- (330:2) -- cycle;
\filldraw[orange!50] (150:1) -- (210:2) -- (330:2)
  -- (30:1) -- (0,-0.5) -- cycle;
\filldraw[orange!50] (90:2) -- (210:2) -- (330:2) -- cycle
  (90:1) -- (210:1) -- (330:1) -- cycle;
```

src



```
\filldraw[orange!50] (90:2) -- (210:2) -- (330:2) -- cycle
  (90:1) -- (330:1) -- (210:1) -- cycle;
```

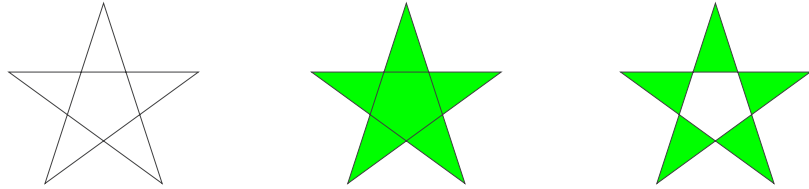


```

\draw      (90:1) -- (234:1) -- (18:1) -- (162:1) -- (306:1) -- cycle;
\draw[fill=green] (90:1) -- (234:1) -- (18:1) -- (162:1) -- (306:1) -- cycle;
\draw[fill=green, even odd rule]
      (90:1) -- (234:1) -- (18:1) -- (162:1) -- (306:1) -- cycle;

```

src



- ▶ editorial board
- ▶ deadlines
- ▶ reviewing process
- ▶ publication
- ▶ **impact factor**
- ▶ **open access**

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Some Computer Science Journals



Impact Factor

- ▶ bibliometric metric measuring average number of citations to recent articles
- ▶ indicator of journal's prestige and impact
- ▶ calculated annually by Clarivate



$$\text{IF}(2025) = \frac{\text{citations in 2025 for articles published in 2024 and 2023}}{\text{number of articles published in 2024 and 2023}}$$

- ▶ examples: Nature 48.5 Science 45.8 CACM 12.2 TCS 1.0

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Open Access

- ▶ **green OA**
 - ▶ self-archiving by authors is permitted
- ▶ **gold OA**
 - ▶ publisher makes all articles and related content available for free
 - ▶ articles are licensed for sharing and reuse via Creative Commons licenses or similar
 - ▶ article processing charge (APC) typically paid through institutional or project funding
- ▶ **diamond OA**
 - ▶ gold OA without APC
- ▶ **hybrid OA**



- ▶ matrices

```
\begin{bmatrix}
a & b & c & d \\
e & \hdotsfor{3} \\
i & j & k & l \\
\end{bmatrix}
```

$$\begin{bmatrix} a & b & c & d \\ e & \dots & & \\ i & j & k & l \end{bmatrix}$$

- ▶ `Bmatrix` `vmatrix` `Vmatrix` produce different delimiters $\{ \}$ $| |$ $|| |$
- ▶ `smallmatrix` environment for use in text $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$

► spacing and dots

abbreviation	command	example	command	description
	<i>(no space)</i>	[]	<code>\dotsc</code>	dots with commas
<code>\,</code>	<code>\thinspace</code>	[]	<code>\dotsb</code>	dots with binary operators/relations
<code>\:</code>	<code>\medspace</code>	[]	<code>\dotsm</code>	multiplication dots
<code>\;</code>	<code>\thickspace</code>	[]	<code>\dotsi</code>	dots with integrals
	<code>\quad</code>	[]	<code>\dotso</code>	other dots
	<code>\qquad</code>	[]		
<code>\!</code>	<code>\negthinspace</code>	[]		
	<code>\negmedspace</code>	[]		
	<code>\negthickspace</code>	[]		

Consider the series A_1, A_2, \dots , the sum $A_1 + A_2 + \dots$, the product $A_1 A_2 \dots$, and the infinite integral

```
\[
\int_{A_1} \int_{A_2} \dots
\]
```

src

Consider the series A_1, A_2, \dots , the sum $A_1 + A_2 + \dots$, the product $A_1 A_2 \dots$, and the infinite integral

$$\int_{A_1} \int_{A_2} \dots$$

► extensible arrows and friends

```
A \xleftarrow{n+\mu-1} B \xrightarrow[\gamma]{n^2+i-1} C
```

```
\overset{*}{X} \quad \underset{\alpha}{Y} \quad \overunderset{*}{\alpha}{Z}
```

```
\sqrt{x}+\sqrt{y}+\sqrt{z} \neq \sqrt{x}+\sqrt{\smash[b]{y}}+\sqrt{z}
```

src

$$A \xleftarrow{n+\mu-1} B \xrightarrow[\gamma]{n^2+i-1} C \quad X \overset{*}{\underset{\alpha}{Y}} \overset{*}{\underset{\alpha}{Z}} \quad \sqrt{x} + \sqrt{y} + \sqrt{z} \neq \sqrt{x} + \sqrt{y} + \sqrt{z}$$

► delimiters

<code>\left</code>	<code>\bigl</code>	<code>\Bigl</code>	<code>\biggl</code>	<code>\Biggl</code>
<code>\right</code>	<code>\bigr</code>	<code>\Bigr</code>	<code>\biggr</code>	<code>\Biggr</code>
$(a)\left(\frac{b}{c}\right)$	$(a)\bigl(\frac{b}{c}\bigr)$	$(a)\Bigl(\frac{b}{c}\Bigr)$	$(a)\biggl(\frac{b}{c}\biggr)$	$(a)\Biggl(\frac{b}{c}\Biggr)$

```
\left[\sum_i a_i \left| \sum_j x_{ij} \right|^p \right]^{1/p}
\quad \text{versus} \quad
\biggl[\sum_i a_i \Bigl| \sum_j x_{ij} \Bigr|^p \biggr]^{1/p}
```

src

$$\left[\sum_i a_i \left| \sum_j x_{ij} \right|^p \right]^{1/p} \quad \text{versus} \quad \biggl[\sum_i a_i \Bigl| \sum_j x_{ij} \Bigr|^p \biggr]^{1/p}$$

```

@article{EWZ08,
  author = "J{\o}rg Endrullis and Johannes Waldmann and Hans Zantema",
  title = "Matrix Interpretations for Proving Termination of Rewrite Systems",
  journal = "Journal of Automated Reasoning",
  volume = 40,
  number = "2-3",
  pages = "195--220",
  year = 2008,
  doi = "10.1007/s10817-007-9087-9"
}

```

- ▶ required fields: author title journal year
- ▶ optional fields: volume number pages month note

```

@phdthesis{B65,
  author = "Bruno Buchberger",
  title = "Ein {A}lgorithmus zum {A}uffinden der {B}asisselemente des
        {R}estklassenringes nach einem nulldimensionalen {P}olynomideal",
  school = "Universit{\a}t Innsbruck",
  year = 1965
}

```

- ▶ required fields: author title school year
- ▶ optional fields: type address month note

```

@techreport{MS91,
  author = "Aart Middeldorp and Mirna Star\v{c}evi'c",
  title = "A Rewrite Approach to Polynomial Ideal Theory",
  number = "CS-R9160",
  institution = "CWI, Amsterdam",
  year = 1991
}

```

- ▶ required fields: author title institution year
- ▶ optional fields: type number address month note

```

@misc{TATA,
  author = "Hubert Comon and Max Dauchet and R{\e}mi Gilleron and
        Christof L{\o}ding and Florent Jacquemard and Denis Lugiez and
        Sophie Tison and Marc Tommasi",
  title = "Tree Automata Techniques and Applications",
  url = "http://tata.gforge.inria.fr/",
  year = 2008
}

```

- ▶ required fields:
- ▶ optional fields: author title howpublished month year note

```

@misc{Haskell,
  title = "Haskell",
  howpublished = "\url{https://www.haskell.org/}",
  note = "Accessed: 2026-04-02"
}

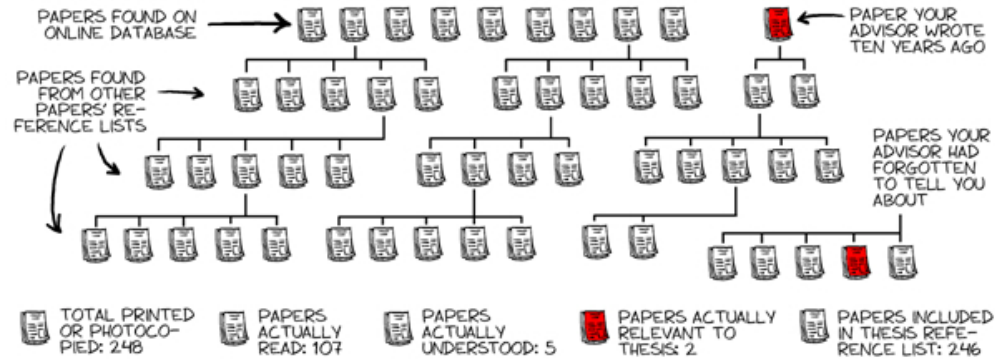
```

[latex src](#) [bib file](#)

REFERENCES

MAKING SURE NO ONE HAS ALREADY WRITTEN YOUR THESIS

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Digital Object Identifier

- ▶ DOI is digital identifier of object to keep track of it
- ▶ <https://doi.org/doi>
- ▶ papers 10.46298/lmcs-21(2:29)2025
- ▶ projects 10.55776/l5943
- ▶ artifacts 10.5281/zenodo.13969852



Open Researcher and Contributor ID

- ▶ ORCID is unique persistent identifier for researchers 0000-0001-7366-8464
- ▶ ORCID record connects researchers with activities
 - ▶ employment affiliations
 - ▶ research outputs
 - ▶ funding
 - ▶ ...



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Homework Exercises for May 7

- ① Reproduce the DOI and ORCID logos shown on slide 27 using TikZ. 1
- ② Determine the 2024 or 2025 impact factors as well as the access models of the journals whose acronyms are given on slide 12. 1
- ③ Typeset the following symbols in \LaTeX : 1
 \times \cap \star \boxtimes $::=$
- ④ What is CiteScore? How does it compare to IF? 1
- ⑤ Summarize the criticism raised at the OA model of the ACM Digital Library. 1