Welcome to a new way of disseminating Science

Form dignifies content

GEA Computing
Through numbers, the Earth
https://www.gea-computing.eu

- Sum

$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$$

```
\sum\limits_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}
```

- Limit

$$\lim_{x \to 0} (\frac{\sin x}{x}) = 1$$

```
\lim\limits_{x \to 0}\ (\frac{\sin x}{x}) = 1
```

- Integral

$$\int_{-\infty}^{\infty} e^{-x^2} \cdot dx = \sqrt{\pi}$$

```
$\int_{-\infty}^{\infty} e^{-x^2}dx = \sqrt{\pi}$
```

- Equation Array

$$\begin{cases} x + y = 2 \\ x - y = 1 \end{cases}$$

```
\begin{cases} x + y = 2 \\ x - y = 1 \end{cases}
```

- Equation

$$\int \sin(x) \cdot dx = -\cos(x) + C \qquad (1)$$

```
\begin {equation} \int \sin (x), dx = -\cos (x) + C \label {Eq.integral}\end {equation}
```

- Reference

As we can see in Equation 1, the integral of sine equals minus cosine.

```
As we can see in Equation \ref {Eq.integral} , the integral of sine equals minus cosine.
```

- Consistency

The use of the \ref command allows for automatic updating of equation numbers, even when the referenced equation is moved to another page or when additional equations are added, greatly improving internal cross-referencing and consistency. Same applies for sections, figures and tables!

PGF – Portable Graphics Format

Goodbye external imports! Create publication-ready plots directly within your document.

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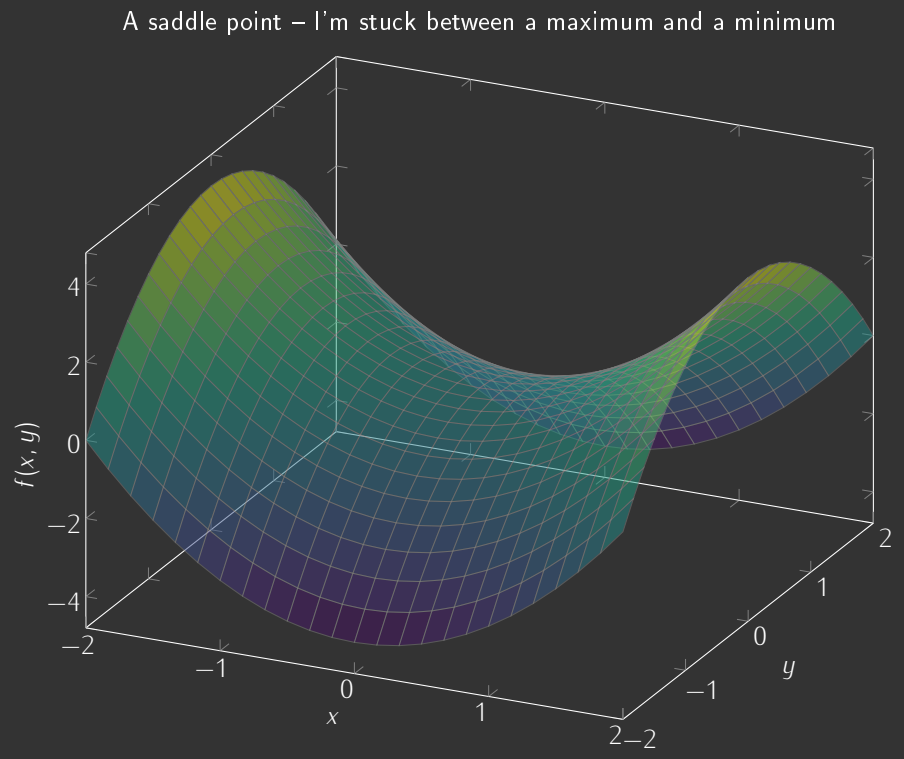

- **Referencing** Whenever you modify the original figure's style, color, or pattern, the link will automatically refresh to reflect the changes, ensuring your document stays consistent:
  This graph represents  *a saddle point*

- **Parametric** Define a 2D curve using parameters
  `\addplot 3[surf,domain=-2:2] {x^2-y^2};`

- **From File** Draw a plot starting from your custom dataset:
  `\addplot table [col sep=comma] {data.csv};`

- **Portability** Write once, present anywhere: generate code for your article (or thesis, or report, or manuscript) and seamlessly reuse it in your presentation, with *no modifications* needed.

- **Clarity** PGF figures are crisp and clear, with no pixelation or loss of detail. They are vector images, which means they can be resized or printed without losing quality, making them perfect for presentations or any other application where clarity and precision matter. Plus, they can be easily exported and printed as standalone images, ideal for posters, flyers, or any other visual material

- **Size** PGF figures also help reduce the size of your document, as they are encoded as text-based commands rather than bulky raster images, resulting in smaller file sizes and faster loading times.

PGF – Portable Graphics Format

More Specialized Examples...

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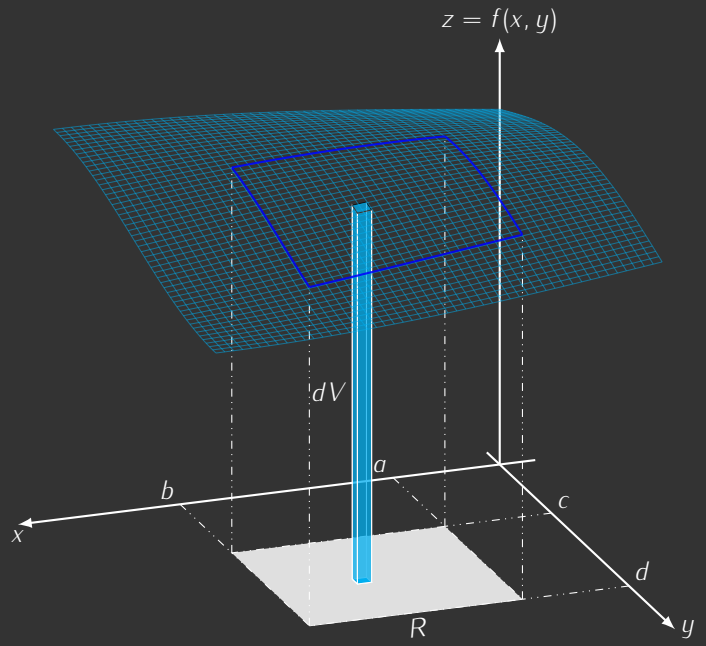

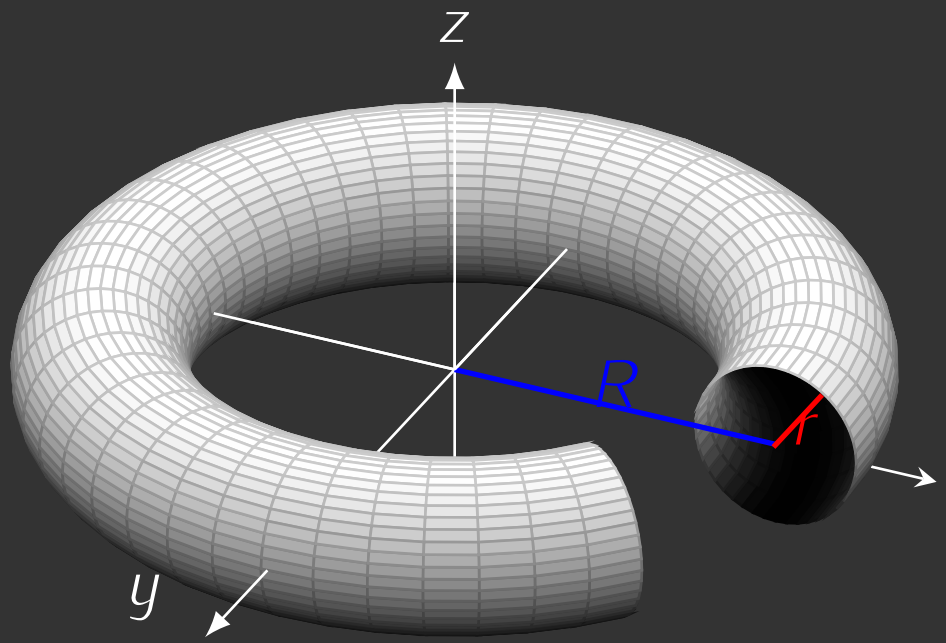

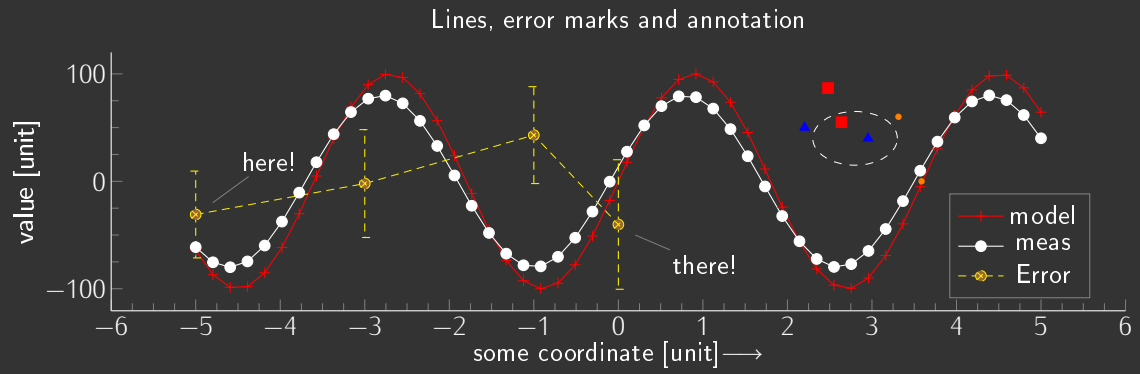

Cross-ref. This plot displays a comparison of simulations (—+—), measurements (—●—) and some strange error (-·-⊗-·-). Labels are automatically generated.

LuaLaTeX and JSON

Code Meets Creativity

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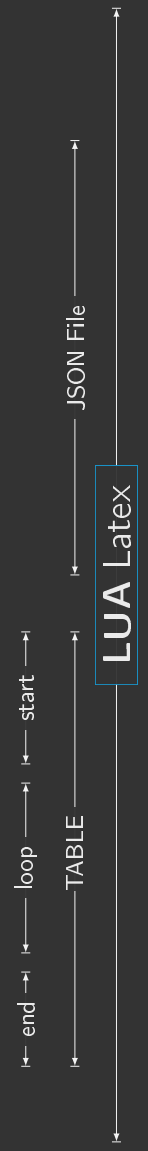
```
\begin{document}

\directlua{
  local experiments = {
    {
      name        = "Trial 1",
      description = "First experiment",
      result      = "Success"
    },
    {
      name        = "Trial 2",
      description = "Second experiment",
      result      = "Failure"
    },
    {
      name        = "Trial 3",
      description = "Third experiment",
      result      = "Pending"
    }
  }

  tex.print("\\begin{tabular}{|l|l|l|}")
  tex.print("\\hline")
  tex.print("Name & Description & Result \\\\")
  tex.print("\\hline")

  for i, experiment in ipairs(experiments) do
    tex.print(experiment.name .. " & ")
    tex.print(experiment.description .. " & ")
    tex.print(experiment.result .. " \\\\")
    tex.print("\\hline")
  end

  tex.print("\\end{tabular}")
}

\end{document}
```



Overview

The LuaLaTeX script reads data from a JSON file and generates a PDF document. The script processes the data programmatically and creates a table that is populated with the data.

Outcome

A dynamically generated document with a table mirroring the data contained within your JSON file.

Result rendered:

Name	Description	Result
Trial 1	First experiment	Success
Trial 2	Second experiment	Failure
Trial 3	Third experiment	Pending

Advantages

- Customizable document generation
- Efficient and automated processing
- Flexible and scalable solution

Bibliography Management and BibTex

Automatically formatting your bibliography, one citation at a time

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BibTeX Entries

```
@article{Doe22,
  title = {Example Article},
  author = {John Doe},
  journal = {Journal of Examples},
  year = {2022},
  volume = {1},
  number = {1},
  pages = {1-10}
}
```

Formatted Citation and Bibliography

```
\cite{example}
\bibliographystyle{plain}    // Change to desired style
\bibliography{bibfile}       // Define the file containing all refs
```

Style definitions apply *globally*. Use a consistent citation style throughout your document and populate your BibTeX file accordingly!

References

[1] John Doe. Example Article. Journal of Examples, 1(1):1-10, 2022.

Citing in LaTex

According to (Doe, 2022), this is crucial.	[APA Style]
According to Doe (2022), this is crucial.	[MLA Style]
According to J. Doe [1], this is crucial.	[IEEE Style]
According to Doe (2022, p. 1), this is crucial.	[Chicago Style]
According to Doe [1], this is crucial.	[ACS Style]
According to Doe et al. (2022), this is crucial.	[Harvard Style]
According to Doe, J. (2022). this is crucial.	[CSE Style]

```
According to \cite {Doe22},
this is crucial.
```

Some Sources relying on BibTex

- Google Scholar (scholar.google.com)
- ACM Digital Library (dl.acm.org)
- ResearchGate (www.researchgate.net)
- Academia.edu (www.academia.edu)
- BibSonomy (www.bibsonomy.org)
- CiteULike (www.citeulike.org)
- Zotero (www.zotero.org)
- Microsoft Academic (academic.microsoft.com)
- CiteseerX (citeseerx.ist.psu.edu)
- ScienceDirect (www.sciencedirect.com)
- SpringerLink (link.springer.com)

Automate your Word Count

Add a trailing section, displaying word count – a detailed one

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type header, containing 3 words

type text (20 elements)

Ode to Numbers

One, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen, twenty.

type equation (1)

$$2 + 2 = 2 \times 2 = 2^2 = \mathbf{4}$$

This string not included in the word count

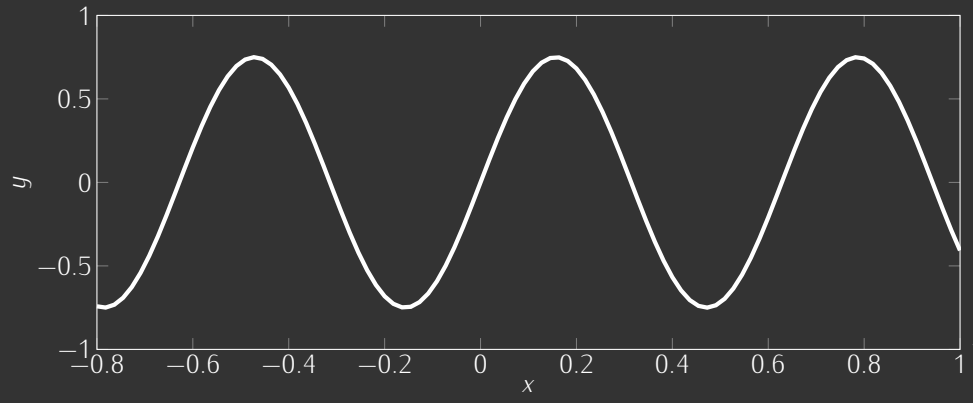

Figure 1: Text-caption-1, Text-caption-2

type caption, containing 2 words

type float/figure (1 element)

- **Usage** Use `texcount` command:

  ```
  texcount -sum main.tex
  ```

- **Result:**

```
Total
Sum count: 26
Words in text: 20
Words in headers: 3
Words outside text (captions, etc.): 2
Number of headers: 1
Number of floats/tables/figures: 1
Number of math inlines: 0
Number of math displayed: 1
```

- **Count:** This snippet is then appended to your PDF document, allowing you to seamlessly integrate an automatically generated word count.

LaTeX– Support and Training

Hop on!

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Target Audience:

- Master & PhD Students (individuals or groups)
- Research Institutions and Team Leaders / PI's.

What we can help you with:

- Thesis typesetting
  - + Selective: Targeted for individual sections or chapters or items
  - + Complete: your entire document transformed into a professional manuscript
- Co-authoring: Collaborative writing and editing of research manuscripts
- **Tailored Templates** for your research papers & technical reports
- Crafting of engaging and informative **presentations tailored** to your research
- Preparation of detailed and organized technical **lecture notes**.

Benefits:

- ✓ Cross-Platform (& web-based!)
- ✓ Reusable Knowledge
- ✓ LaTeX is FREE!

Outcome:

- Professionally typeset document
- Improved research visibility, increased impact.
- Streamlined collaboration

"As a PhD student/team leader, I struggle with formatting and layout in Word, despite my best efforts. I know LaTeX is better for academic writing, but I find the learning curve overwhelming. I'm also concerned that Word's limitations slow down our research group's productivity and collaboration. Can GEA Computing help us transition to LaTeX and provide the support we need to get started quickly?" – Does this challenge resonate with you?

- Size

  The size of this PDF is 376 KB
  (yes, less than *half a megabyte*)