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Single Day Event

NEST 2.0 and experiment with AI

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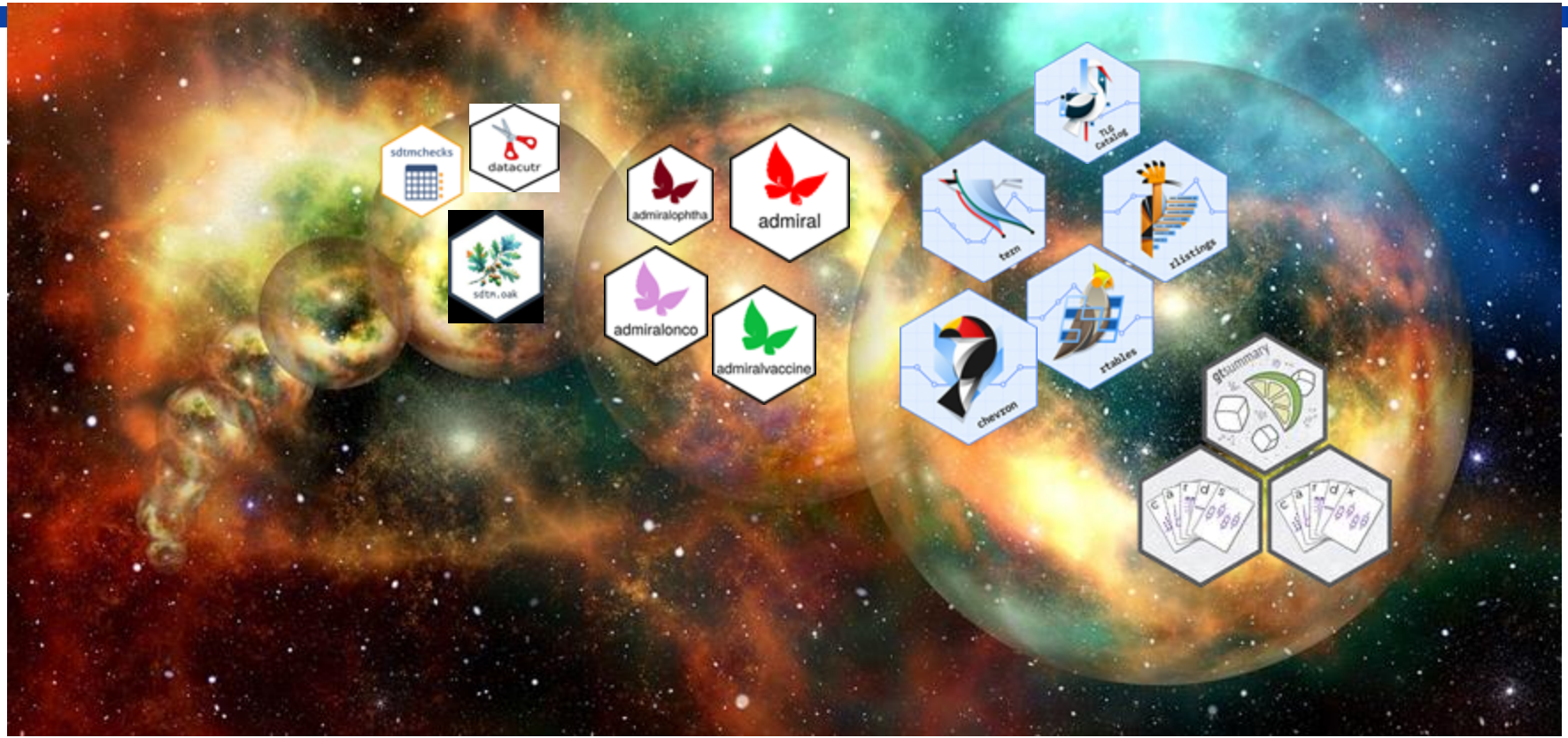
Overview

- NEST project history from 0.1 to 2.0
- Documents creation
  - Docx
  - Autoslider
- AI integration

The End-to-End clinical reporting open-source projects

The End-to-End clinical reporting open-source projects



NEST v0.1 to v1.0 workflow

	A: Drug X (N=134)	B: Placebo (N=134)	C: Combination (N=132)	All Patients (N=400)
Age (yr)	-	-	-	-
n	xx.	xx.	xx.	xx.
Mean (SD)	xx.x (xx.x)	xx.x (xx.x)	xx.x (xx.x)	xx.x (xx.x)
Median	xx.x	xx.x	xx.x	xx.x
Min - Max	xx.x - xx.x	xx.x - xx.x	xx.x - xx.x	xx.x - xx.x
Continous Level Biomarker 1	-	-	-	-
n	xx.	xx.	xx.	xx.
Mean (SD)	xx.x (xx.x)	xx.x (xx.x)	xx.x (xx.x)	xx.x (xx.x)
Median	xx.x	xx.x	xx.x	xx.x
Min - Max	xx.x - xx.x	xx.x - xx.x	xx.x - xx.x	xx.x - xx.x

	A: Drug X (N=134)	B: Placebo (N=134)	C: Combination (N=132)	All Patients (N=400)
Age (yr)				
n	134	134	132	400
Mean (SD)	33.8 (6.6)	35.4 (7.9)	35.4 (7.7)	34.9 (7.4)
Median	33.0	35.0	35.0	34.0
Min - Max	21.0 - 50.0	21.0 - 62.0	20.0 - 69.0	20.0 - 69.0
Continous Level Biomarker 1				
n	134	134	132	400
Mean (SD)	6.0 (3.6)	5.7 (3.3)	5.6 (3.5)	5.8 (3.4)
Median	5.4	4.8	4.6	4.8
Min - Max	0.4 - 17.7	0.6 - 14.2	0.2 - 21.4	0.2 - 21.4

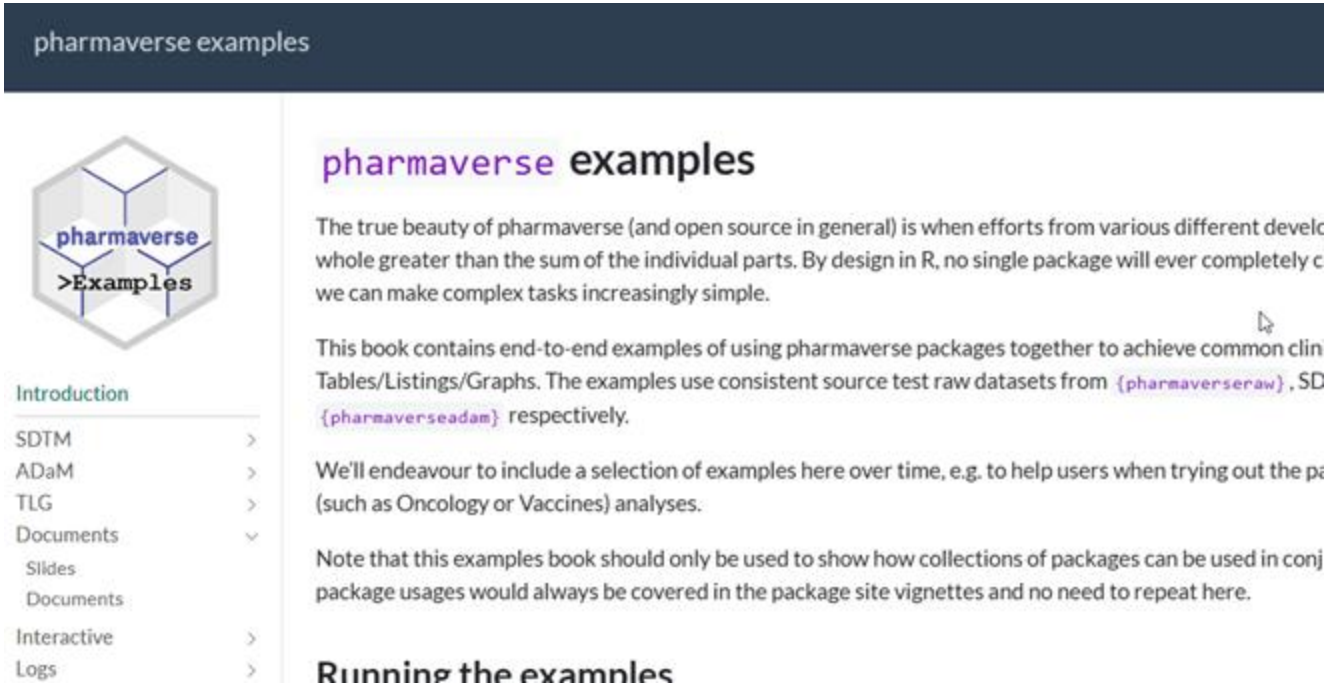
NEST 2.0

```
1  library(gtsummary)
2  library(tidyverse)
3
4  trial %>%
5    select(trt, age, grade, response) |
6
7
```

NEST 2.0+? Streamline the workflow with upstream and downstream teams

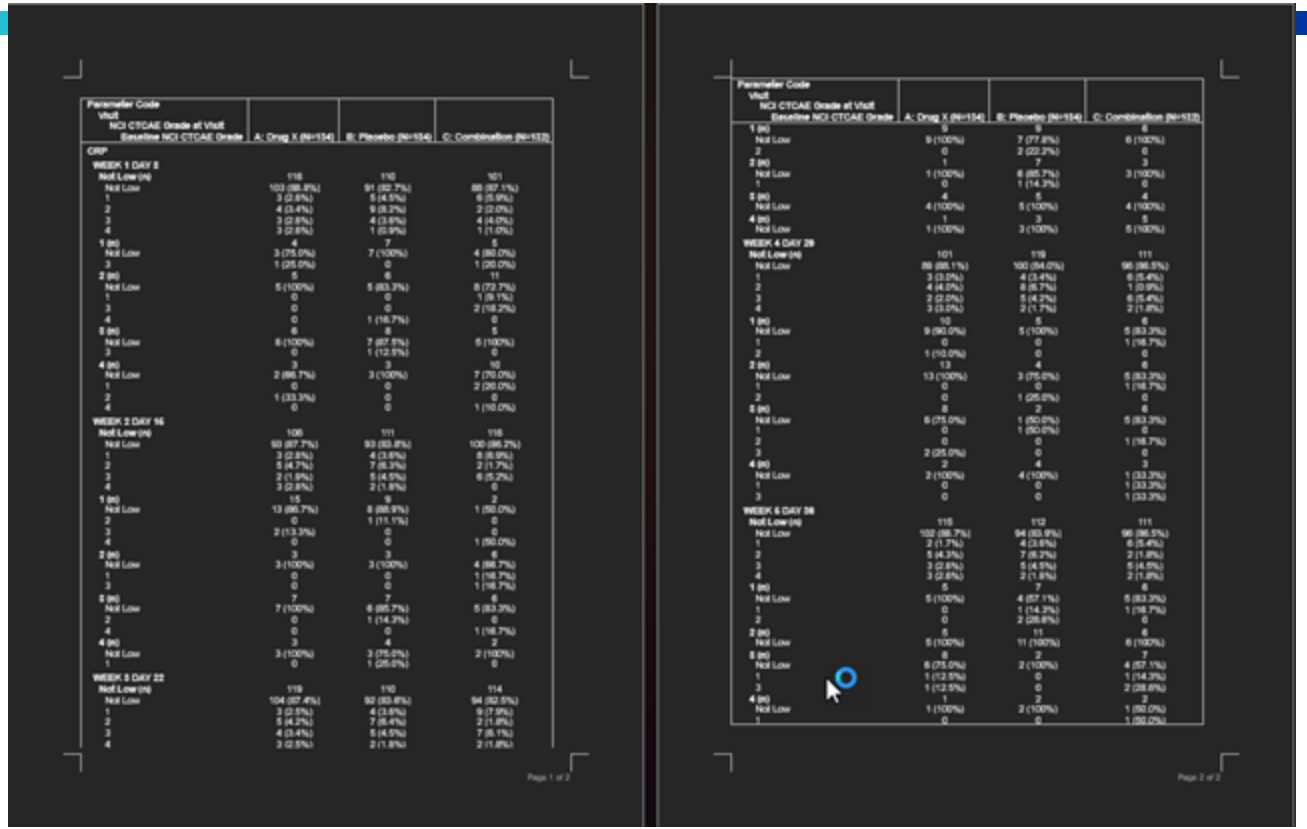
Pharmaverse examples

- https://pharmaverse.github.io/examples/



Rtables word document output

- export_as_docx



AutoslideR Workflow

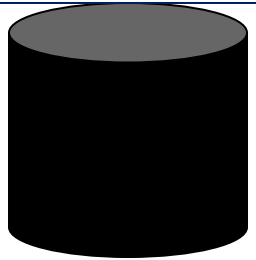
```
ITT:
  title: Intent to Treat Population
  condition: ITTFL =='Y'
  target: adsl
  type: slref
```

```
SER:
  title: Serious Adverse Events
  condition: AESER == 'Y'
  target: adae
  type: anl
```

filters.yml

spec.yml

```
- program: t_dm_slide
  titles: Patient Demographics and Baseline Characteristics
  footnotes: 't_dm_slide footnote'
  paper: L6
  suffix: ITT
  args:
    arm: "TRT01A"
    vars: ["SEX", "AGE", "RACE", "ETHNIC", "COUNTRY"]
```

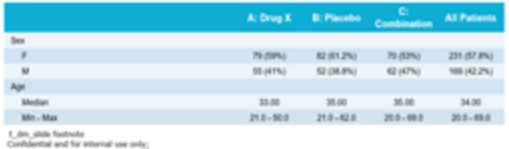


run_script.R

TLG objects

Ooptional
comprehensive templates for users to start with

Patient Demographics and Baseline Characteristics, Full Analysis Set



Integrating AI & LLM prompting

Deploy local/remote LLM models and uses a prompt.yml file to generate insights for tables and graphs.

```
prompt_list <- get_prompt_list("example_study/prompt.yml")

# Generate the initial outputs
outputs <- spec %>%
  filter_spec(program %in% c("t_tte_slide")) %>%
  generate_outputs(datasets = data) %>%
  decorate_outputs()

# Get AI notes using Deepseek
outputs_ai <- get_ai_notes(
  outputs = outputs,
  prompt_list = prompt_list,
  platform = "deepseek",
  base_url = "https://api.deepseek.com",
  model = NULL,
  api_key = "xxxxxxxxxxxxxxxxxxxxxxxxxxx"
)

outputs_ai %>%
  generate_slides(outfile = "My_AI_Presentation.pptx")
```

prompt.yml

```
- output: t_tte_slide_PFSINV_FAS
  prompt: "

{table_text}

Compare the 'Median' of A: Drug X, C: Combination, and B: Placebo in this table
with the Arm A, B and C data of study Impower131.
"
```

An example for AI-speaker notes

Time to Event Summary for Progression Free Survival by Investigator, Full Analysis Set

	A: Drug X (N=134)	B: Placebo (N=134)	C: Combination (N=132)
Patients with event (%)	79 (59.0%)	84 (62.7%)	95 (72.0%)
Median (Months, 95% CI)	8.6 (7.7, 9.1)	8.4 (7.9, 8.8)	7.6 (7.2, 8.2)
Stratified HR (95% CI)	0.89 (0.65, 1.21)		1.26 (0.94, 1.69)
p-value (log-rank)	0.4519		0.1210
6-month event free rate (%)	72.4	72.4	68.2
95% CI	(64.8184, 79.9577)	(64.8184, 79.9577)	(60.2361, 76.1275)
12-month event free rate (%)	NA	NA	NA
95% CI	NA	NA	NA

1. Comparison of Median Progression-Free Survival (PFS)

Provided Table (Investigator-Assessed):
* **A: Drug X:** 8.6 months (95% CI: 7.7, 9.1)
* **B: Placebo + Chemo (Control Arm):** 8.4 months (95% CI: 7.9, 8.8)
* **C: Combination (Atezolizumab + Chemo):** 7.6 months (95% CI: 7.2, 8.2)

Published IMpower131 Results (Blinded Independent Central Review (BICR) Assessed):
* **Arm C: Atezolizumab + Carboplatin + nab-Paclitaxel:** **6.3 months**
* **Arm B: Atezolizumab + Carboplatin + Paclitaxel:** **6.2 months**
* **Arm A: Carboplatin + nab-Paclitaxel (Control):** **5.6 months**

Analysis and Interpretation:

1. **Absolute Value Difference:** The median PFS values in the provided table are **higher across all arms** compared to the final published results. This is a well-known phenomenon and expected. **Investigator-assessed PFS** often results in longer median survival estimates than **BICR-assessed PFS** because investigators may be more conservative in calling progression in a non-blinded setting, especially when they know the patient is on an experimental therapy.

2. **Relative Relationship is Key:** Despite the difference in absolute values, the **relative relationship between the arms is the same** and tells the true story:
   * In both datasets, the **experimental arm (C: Combination)** shows a **numerically longer median PFS** than the control arm (B: Placebo).
   * **Provided Table:** Combination (7.6 mo) > Control (8.4 mo) → **1.2-month improvement**
   * **Published Data:** Experimental (6.2/6.3 mo) > Control (5.6 mo) → **~0.6-0.7-month improvement**
   * This consistency confirms the presence of a treatment effect.

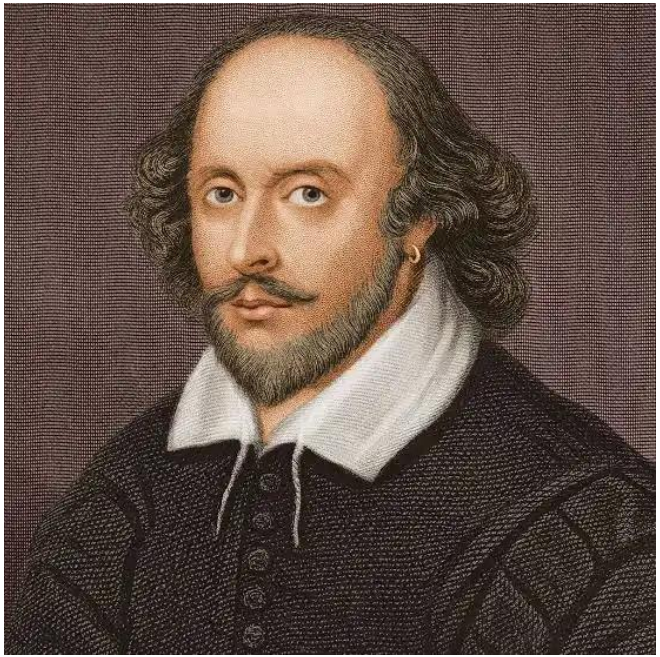
Why AI Excels at Understanding DOCX Tables

- Explicit Hierarchy and Relationships
- Rich Metadata and Properties
- Standardization and Predictability
- Separation of Content and Presentation

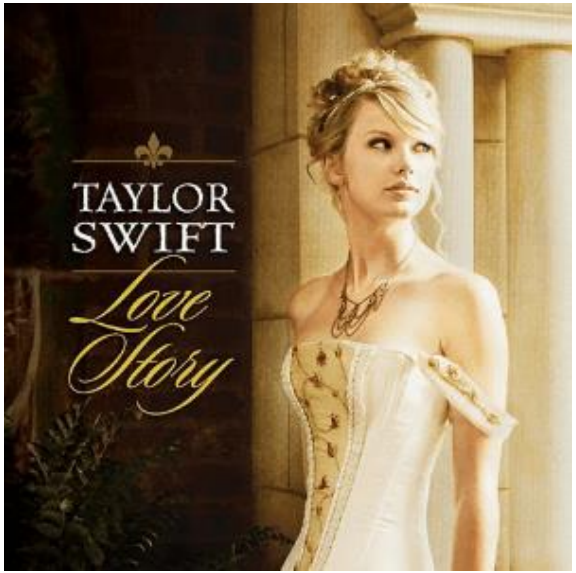
Summary

- NEST team contributes 11 R packages towards pharmaverse initiative, and continuously working closely with other project teams shaping the future of clinical reporting using R
- NEST 2.0 workflow streamlines the work process without creating a table shells, and use analysis result data
- We extend the TLG creation process downstream to document generations in docx and pptx
- The documents can interact with AI for insights generation

Focus on the use case, not AI

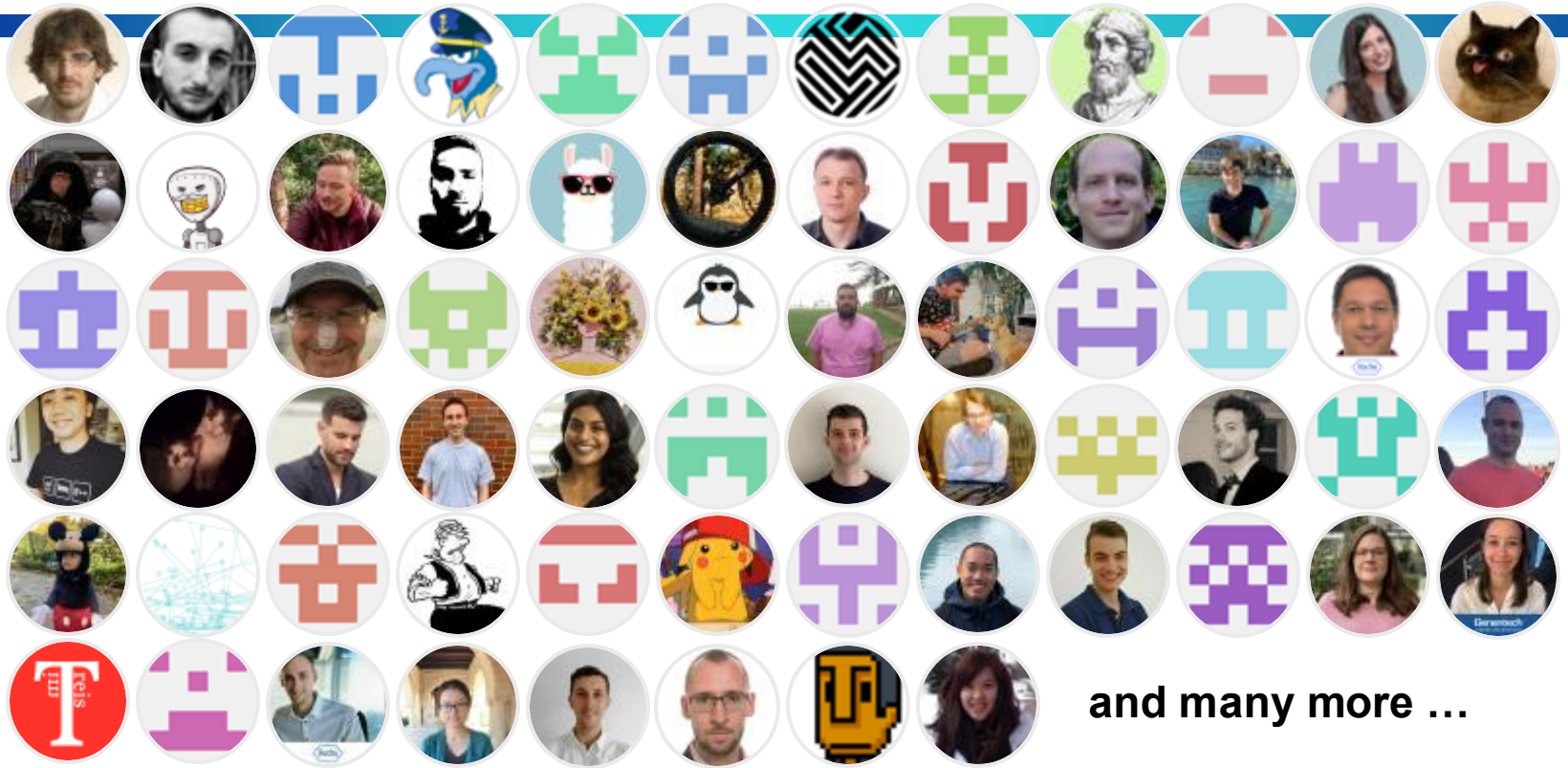


AI



use case

Acknowledgement



and many more …

The Global Healthcare Data Science Community

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