Working Group 5 Report

Stochastic thinking

(probability and statistics education)

US

We speak

Turkish, Greek, Italian, Spanish, Portuguese, French, German, Dutch, Norwegian, Swedish and English

Group leaders

Arthur Bakker (NL)

Pedro Arteaga (Spain)

Andreas Eichler (Germany)

Corinne Hahn (France)

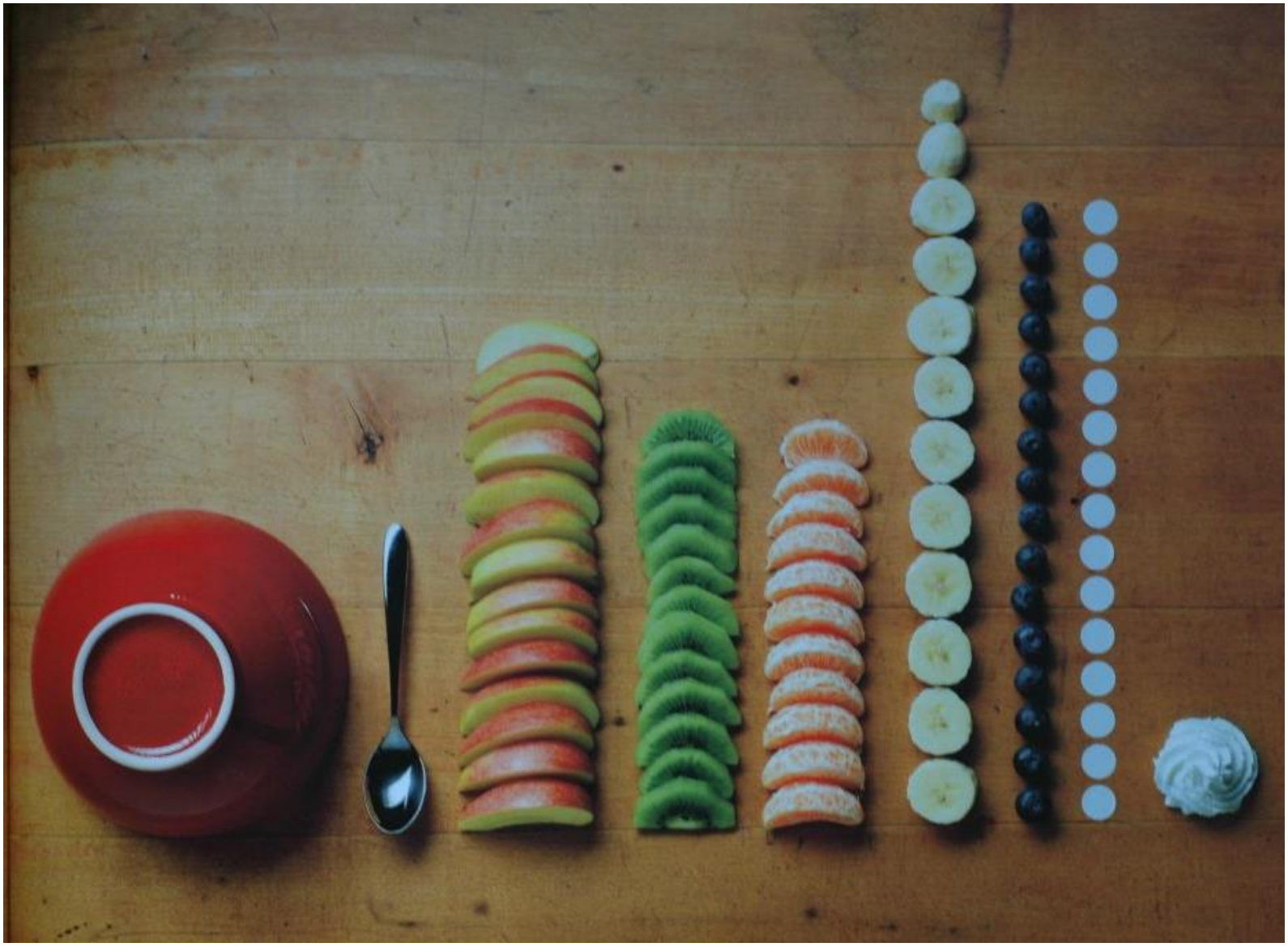
What did we do?

Statistics and probability educators organize the world so they can analyze it

Here is a typical WG day

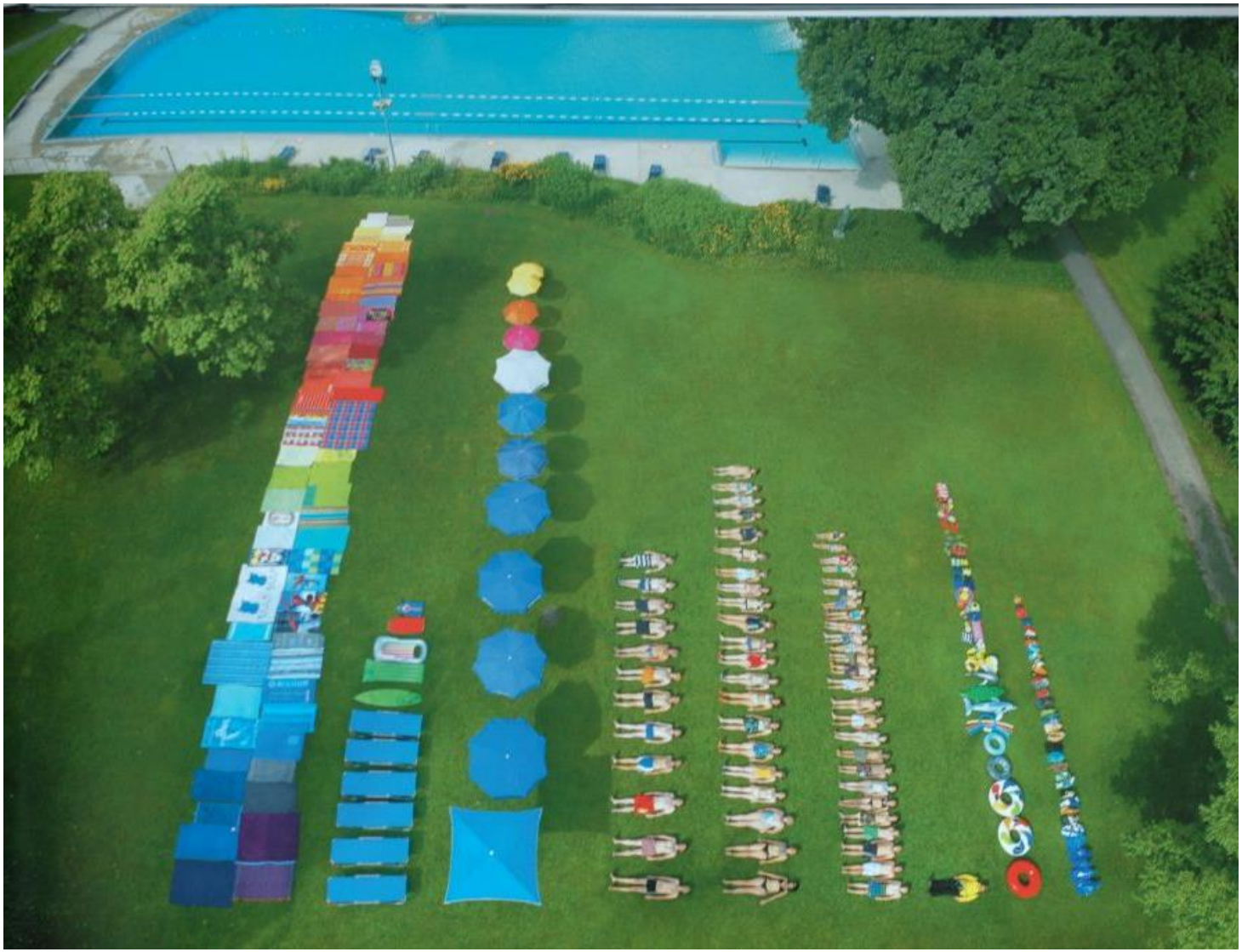
At breakfast

We made graphs

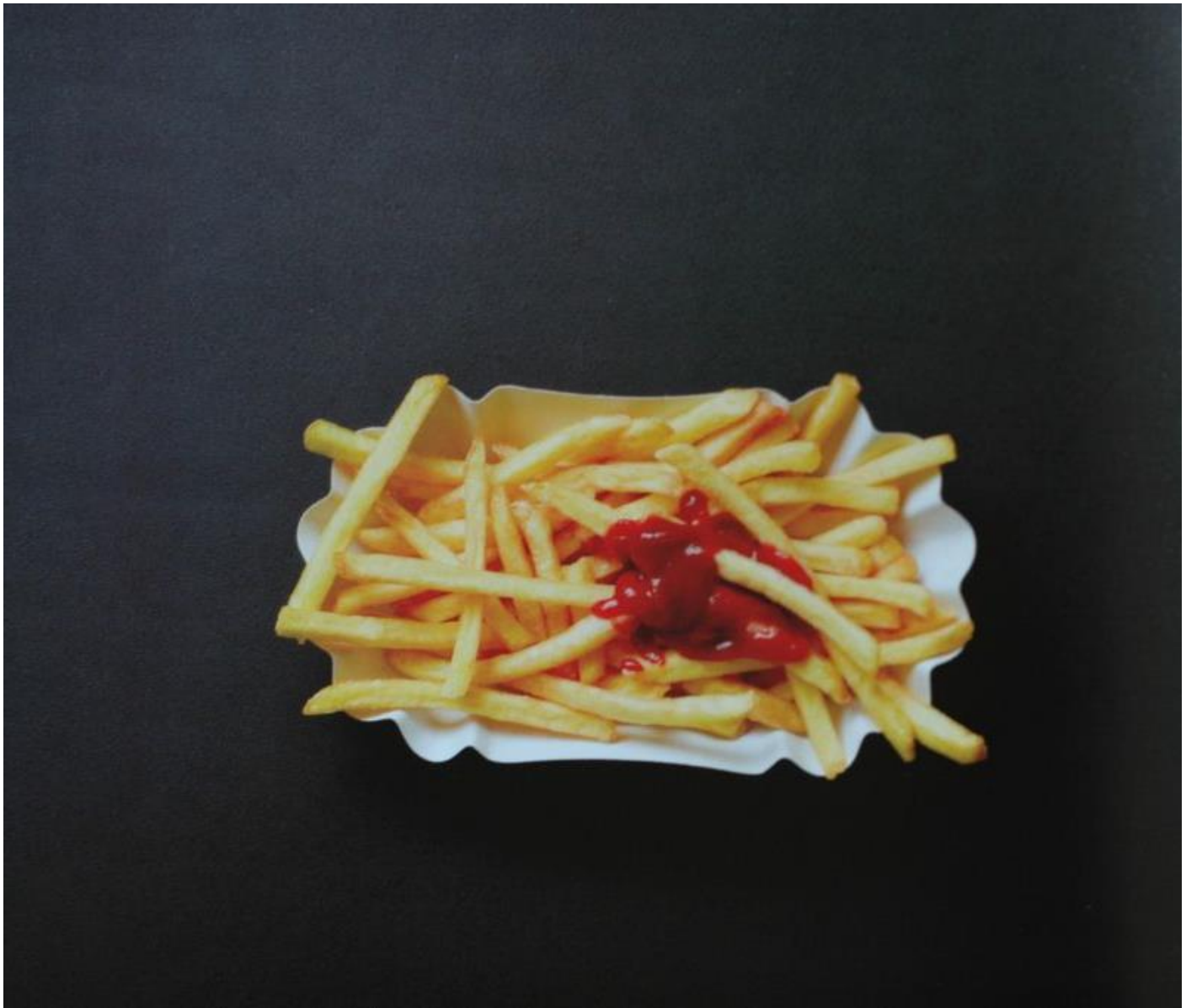


Then we enjoyed the beautiful weather. Not as you did:

But in an organized way:



Over lunch we preferred Western food



But only organized properly

This daily scheme helped us focus on the following themes:

1. Student learning
2. Teacher knowledge
3. And some more general issues

Feel free to jump in and link with your own WG!

Students

- Language is an important mediating tool; oftentimes students seem to have good intuitions but poor language to express them (Sproesser)
- What are suitable tasks to diagnose students' intuitions or understanding (Eichler & Vogel)

udents continued

Journalistic rhetoric?

One discussant asked for more prescriptive research

General pi ure from

- Their knowledge o
  was disappointing
  Kontogianni; Yolcu)

- There are promising ideas or interventions in which students develop understanding (Bakker; Plicht; Schnell; Soto-Andrade)

Tertiary students and teachers

- Often disappointing results (Arteaga; Cañadas; González; Quintas, Oliveira; Santos, Ponte)
  One discussant wondered: should we teach probability and statistics at all given their disappointing content knowledge?
- Challenge of contextualizing (Eckert & Nilsson)
- Yet, also here promising directions: use of applets (Nascimento) and randomization with TinkerPlots (Frischemeier & Biehler)

Teacher knowledge

Perhaps WG17 can help us

We have too many frameworks

PCK

MKT

SKT

…

General issues

Definitions of key concepts

- Variability
- Statistical literacy
- Statistical thinking
- Statistical literacy
- But also construct, conception… Semiotic conflict, cognitive conflict (concept formation in flux)

General issues continued

Stochastics

- Origin of the name; theorizing on its nature (Andra & Stanja)

Connection with:

- Context (Eckert, Nilsson; Bakker)
  risk: Hauge)
- People from a different field (Hahn)
- Mathematics: support in math → more confidence in statistics (Primi &Chiesi)

Technology

- Teachers made more mistakes with Excel than without (Arteaga et al.): cause?
- Impact on what people need to learn about maths/stats

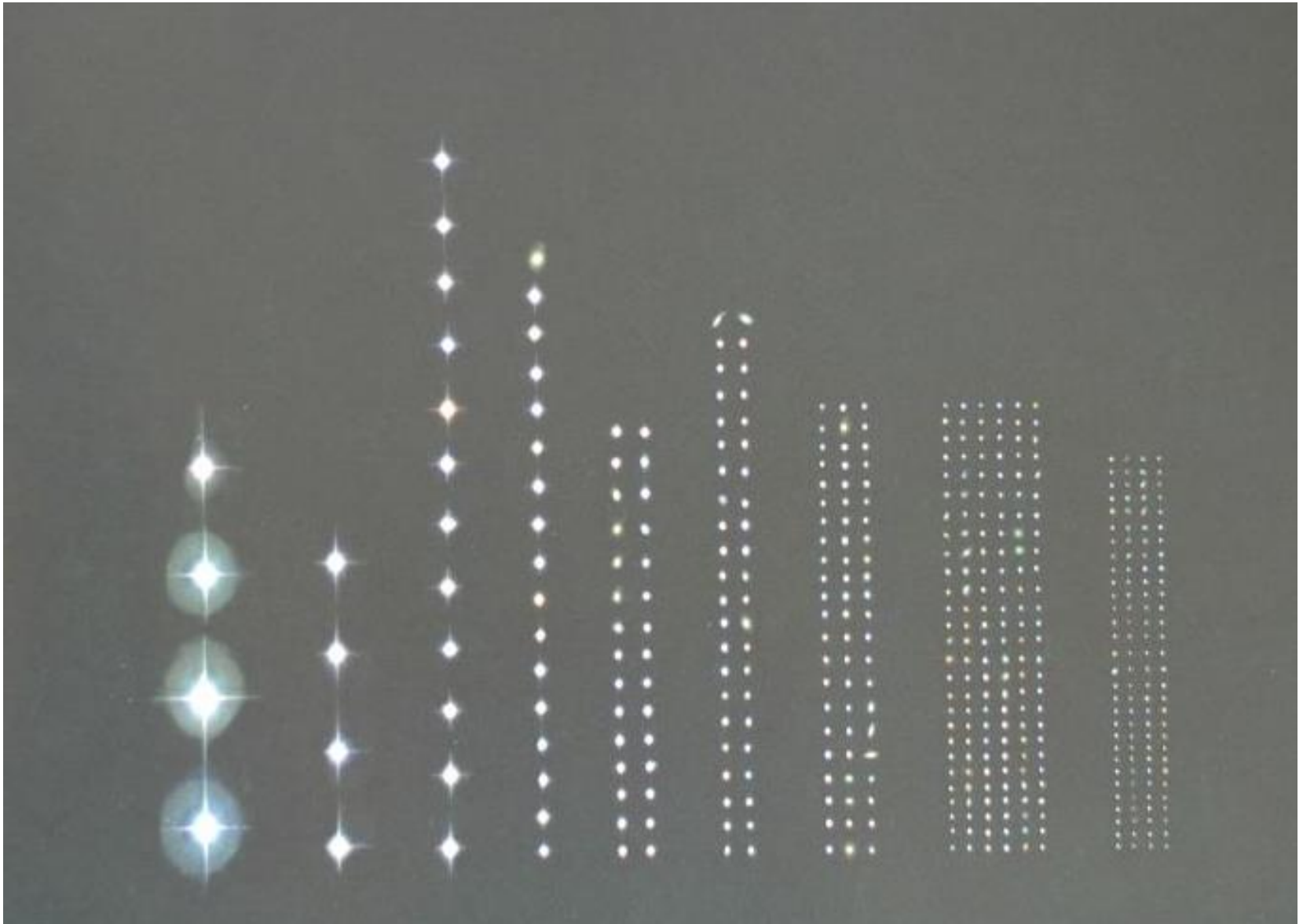
Plans for the future

- European project?
- Collect data about how we encounter probability and stochastics in daily life

Just before the Gala dinner

We could not help it, sorry

After the Gala dinner



THANK YOU FOR YOUR VISIT!