





Protein basics

Outline:

- Polymers of amino acids
- Order specified by bases in mRNA
- Fold spontaneously into catalytic structures, driven by hydrophobic effects and hydrogen bonds

Learning Objectives:

- Describe protein 1° and 2° structure
- Relate to gene structure



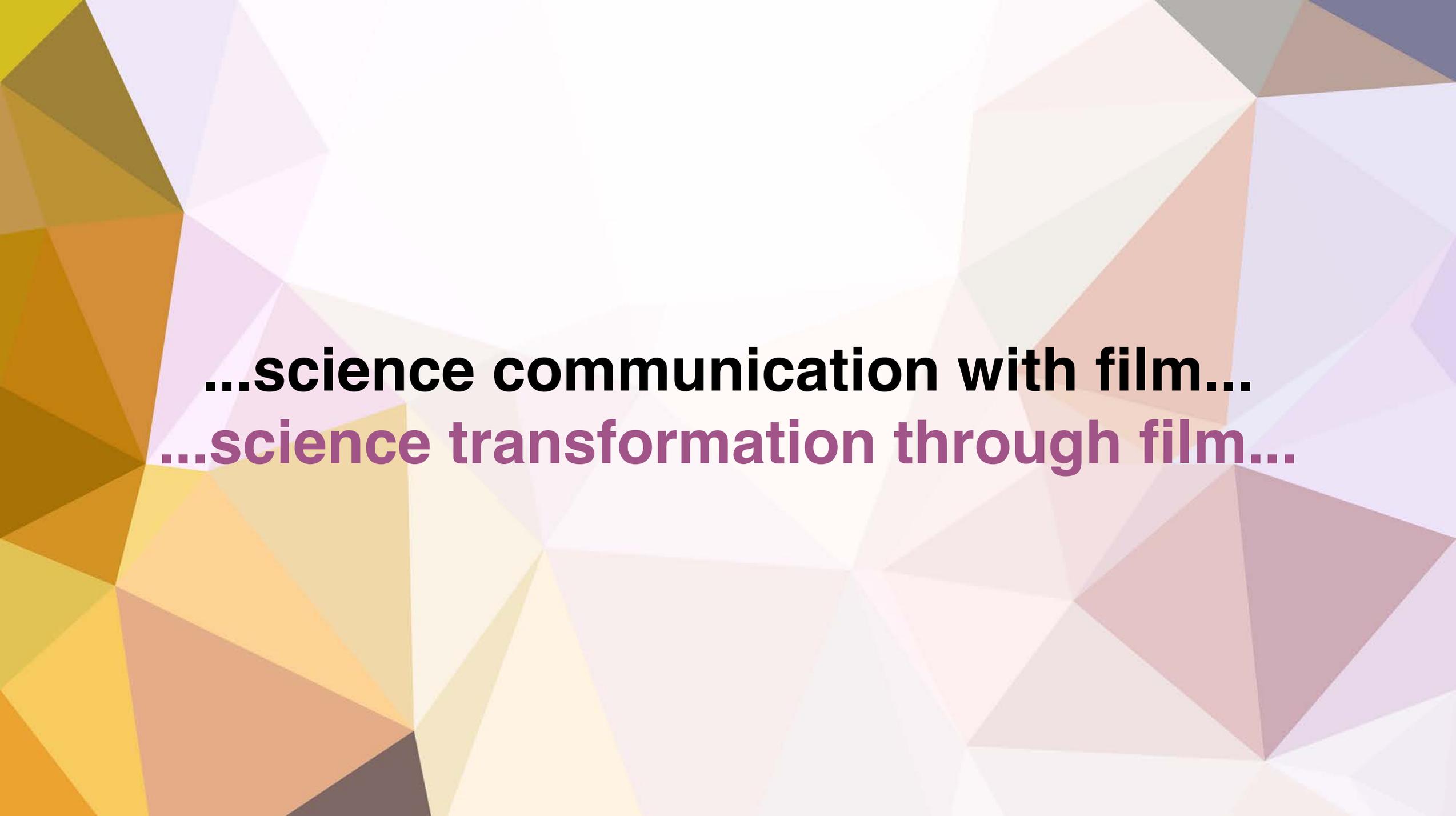
2

```
ages.c (-src3m) - gedit
// declare array an array to store everyone's age
27 int ages[n];
28
29 // get everyone's age
30 for (int i = 0; i < n; i++)
31 {
32     printf("Age of person #i: ", i + 1);
33     ages[i] = GetInt();
34 }
35
36 // report everyone's age a year hence
37 printf("Time passes...\n");
38 for (int i = 0; i < n; i++)
39 {
40     printf("A year from now, person #i will be %i years old.\n", i + 1, ages[i] + 1);
41 }
42 }
```

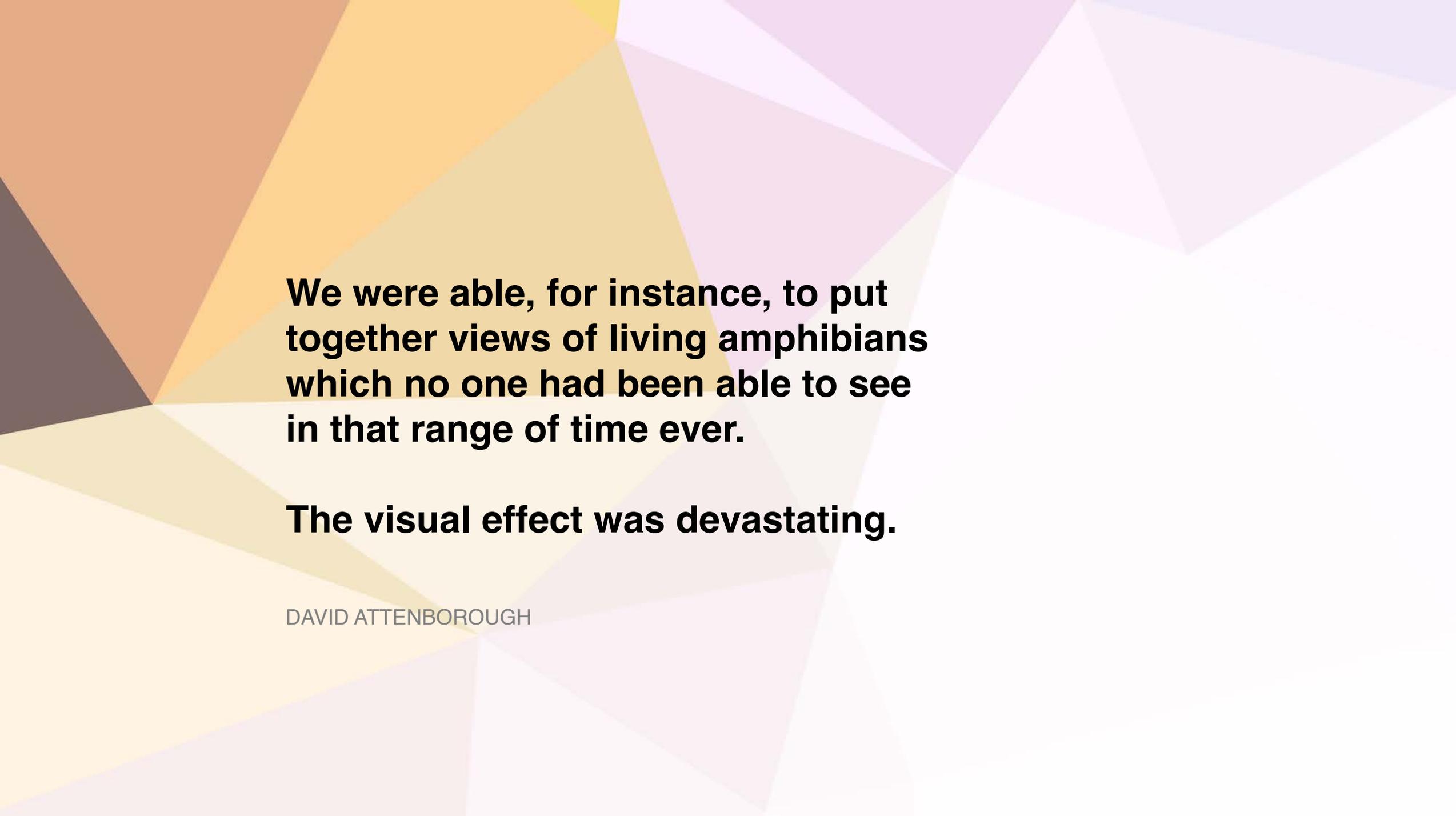


What Does Scalable Mean?

- Operationally:
 - In the past: "Works even if data doesn't fit in main memory"
 - Now: "Can make use of 1000s of cheap computers"
- Algorithmically:
 - In the past: If you have N data items, you must do no more than N^m operations -- "polynomial time algorithms"
 - Now: If you have N data items, you must do no more than $N \cdot k$ operations, for some large k
 - Polynomial-time algorithms must be parallelized
 - Soon: If you have N data items, you should do no more than $N \cdot \log(N)$ operations
 - As data sizes go up, you may only get one pass at the data
 - The data is streaming -- you better make that one pass count
 - Ex: Large Synoptic Survey Telescope (30TB / night)



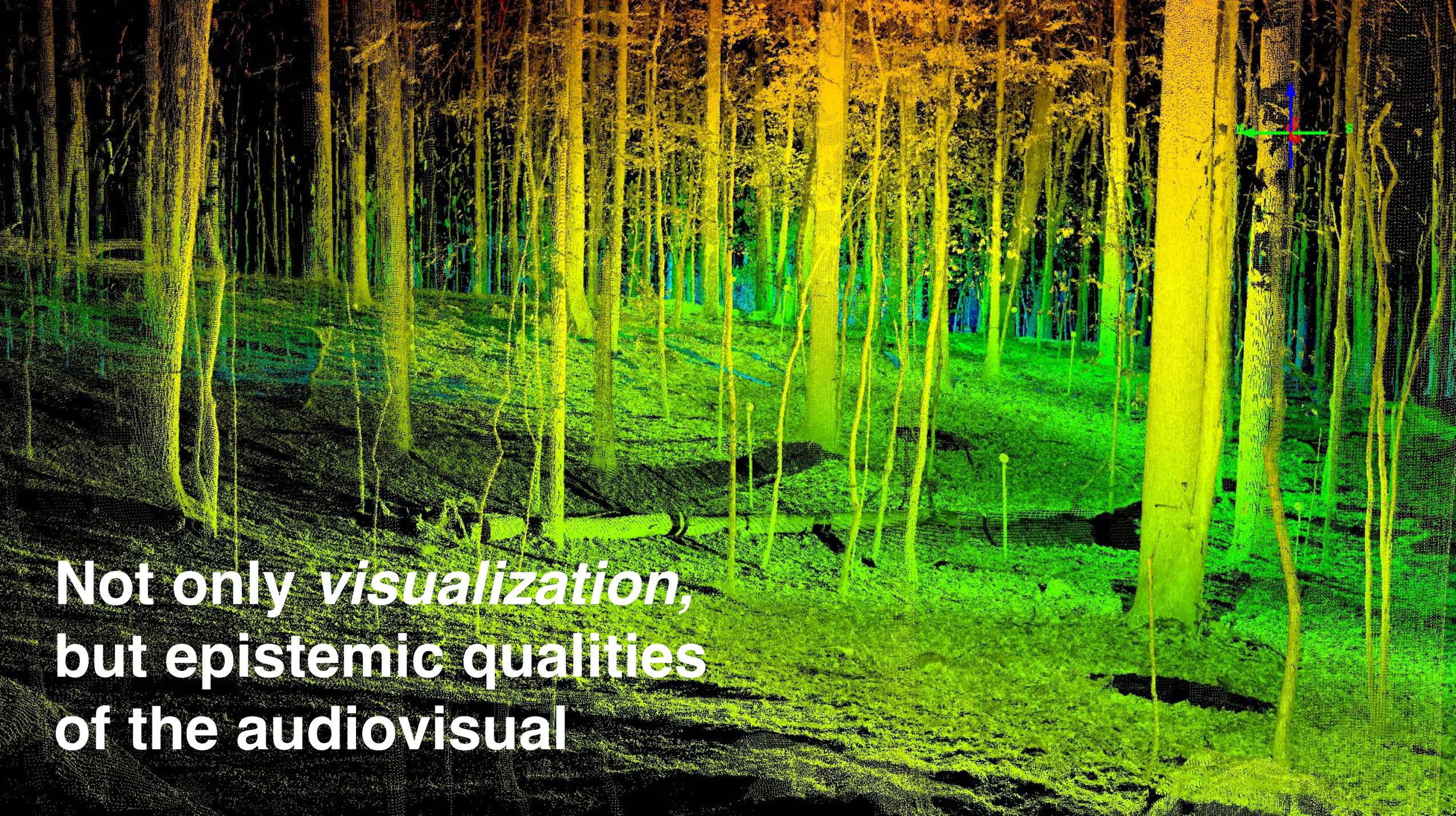
...science communication with film...
...science transformation through film...



We were able, for instance, to put together views of living amphibians which no one had been able to see in that range of time ever.

The visual effect was devastating.

DAVID ATTENBOROUGH



**Not only *visualization*,
but epistemic qualities
of the audiovisual**

A task that is not ungrateful would be [...], to record the shooting of a forest mushroom or the rotation of a sunflower during a day in a series of shots. The growth could be studied in this way very beautifully.

GEORGE WHITESIDES IN BERKOWITZ, JACOB: "VIDEO ABSTRACTS, THE LATEST TREND IN SCIENTIFIC PUBLISHING: WILL PUBLISH OR PERISH SOON INCLUDE VIDEO OR VANISH?"

2013

A task that is not ungrateful would be [...], to record the shooting of a forest mushroom or the rotation of a sunflower during a day in a series of shots. The growth could be studied in this way very beautifully.

TRANSLATED INTO ENGLISH,
ORIGINAL IN GERMAN:

LUDWIG MACH: »UEBER DAS PRINCIP DER
ZEITVERKÜRZUNG IN DER SERIENPHOTOGRAPHIE«,

1893

You had to be able to describe your science in words, or tables, or in plots, in two-dimensions on a piece of paper. [...] With videos, you can now describe dynamic phenomena which are simply too complicated, too complex, too unusual, too full of information to do in words and two-dimensional pictures’.

GEORGE WHITESIDES IN BERKOWITZ, JACOB: “VIDEO
ABSTRACTS, THE LATEST TREND IN SCIENTIFIC
PUBLISHING: WILL PUBLISH OR PERISH SOON INCLUDE
VIDEO OR VANISH?” *UNIVERSITY AFFAIRS*,

2013



Co-Design: World's collide!



**Technoaesthetics
(Technology & Aesthetics)**



Julie Huang

Behavioural Lab Manager



“The Diversity of Empathy“

European Society for Literature, Science
and the Arts, University of Basel



“Social Conflicts”

r4d, SNF, synthesis project ETH Zurich,
University Geneva, University Lausanne



(Audio)visual Language
rhetorics and characteristics

IMAGE-SOUND RELATION IN FILM

Synchrese:

«forging of an immediate and necessary relationship between something one sees and something one hears at the same time.»

MICHEL CHION: AUDIO-VISION: SOUND ON SCREEN, 1994.

**Chair of Ecosystem
Management, ETH Zurich**
Prof. Dr. Jaboury Ghazoul



Oxford University;
Himalayan Wolf Project
Geraldine Werhahn





► Focus on the message,
not the messenger.

Be generous.

Kill your darlings.

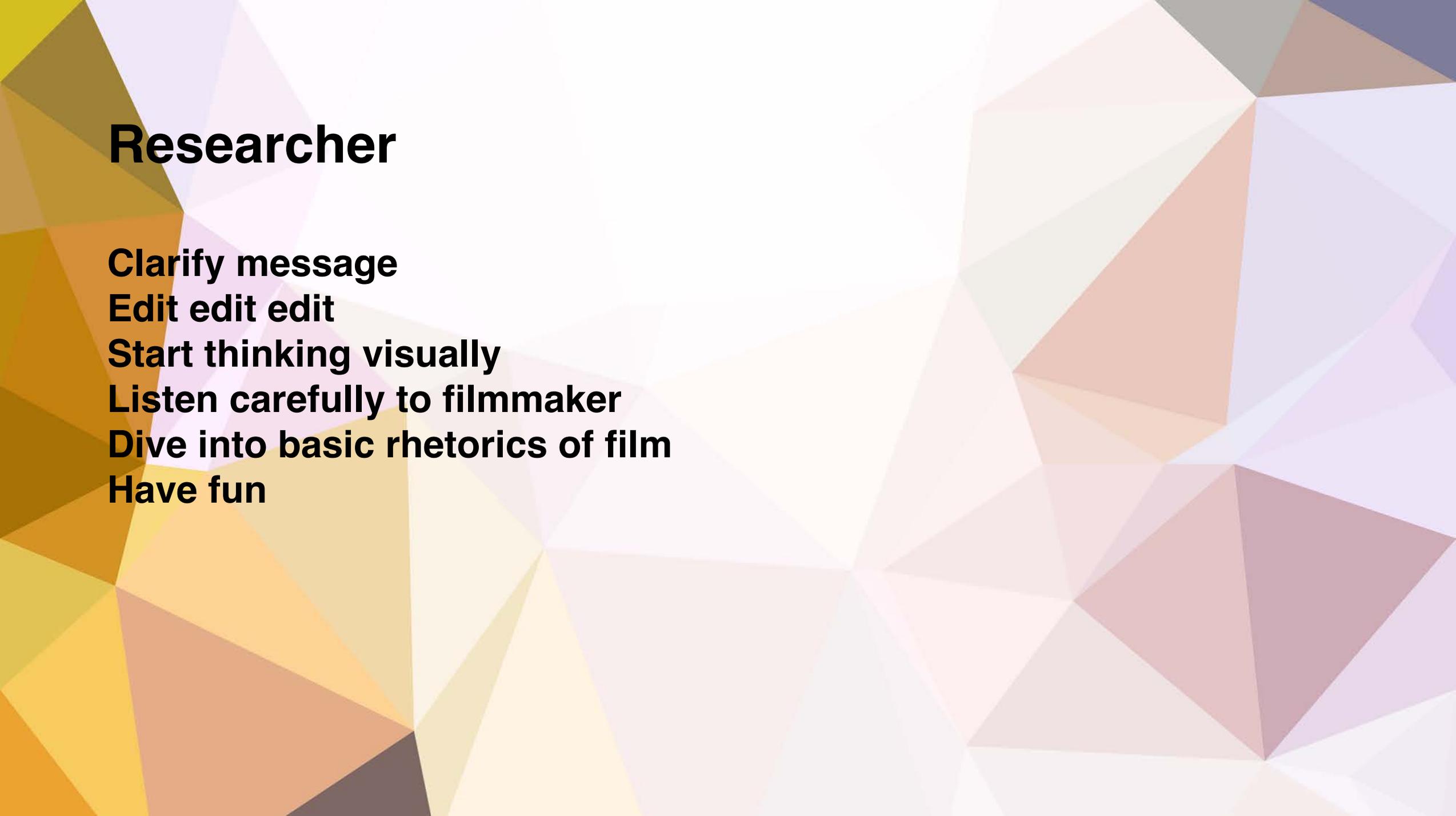
Film making is never a oneman show

*If you do not want to collaborate,
go run a marathon.*

COLLABORATIVE PROCESS DESIGN AND CO-AUTHORSHIP

*Filmmaking is never a
one-man-show.*

*If you do not want to
collaborate, write a book.*



Researcher

Clarify message

Edit edit edit

Start thinking visually

Listen carefully to filmmaker

Dive into basic rhetorics of film

Have fun

Researcher

Clarify message

Edit edit edit

Start thinking visually

Listen carefully to filmmaker

Dive into basic rhetorics of film

Have fun

Filmmaker

Responsibility «good light»

«Changing perspectives»

Stay high-quality aware

Be strikt on deadlines, decisions

Dive into basics of researchers area

Avoid meaningless hyperaesthetics

Have fun

► *Video made and*

killed the lecture star



Jeanine Reutemann

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