



**GENER<sup>2</sup>A<sup>1</sup>T<sup>3</sup>IVE**



# **COGNITIVE ASPECTS OF GA**

**ALGORITHMIC THINKING  
AND  
PROCEDURAL LITERACY**

**COGNITIVE ASPECTS OF GENERATIVE METHODOLOGY  
INSTRUMENTAL FOR THE ARTISTS' CREATIVE APPROACH  
AND FOR RECOGNITION OF THEIR ACHIEVEMENTS**

# **DEVELOPMENT OF GA PROJECTS INVOLVES TWO COMPLEX, INTERRELATED MODES OF THINKING**

- **Matching controlled and the unpredictable elements into a coherent system.**
- **Design of algorithms as multi-purpose or task- specific tools.**

**MATCHING CONTROLLED AND THE UNPREDICTABLE ELEMENTS  
REQUIRES EXPERIENCE, KNOWLEDGE AND INTUITION  
TO ANTICIPATE THE PERFORMATIVE QUALITIES OF  
GENERATIVE SYSTEM**

## COVERED THESE QUALITIES IN PREVIOUS LECTURE

- Controlled elements to be clearly defined and reasonably predictable.
- Their logic and functionality should carry a narrative or a message.
- Meaningful unpredictable elements.
- Meaningful interaction between the predictable and unpredictable elements.
- Motivation for arranging this interaction to be interesting and engaging.

**DESIGN OF ALGORITHMS**

**REQUIRES PROCEDURAL LITERACY**

**REGARDLESS OF MEDIA IN WHICH YOU WORK**

**ALSO REQUIRES PROGRAMMING SKILLS**

**IF YOU USE CREATIVE CODING**

## **PROCEDURAL LITERACY**

**ABILITY TO THINK, READ AND WRITE PROCESSES,  
TO ENGAGE IN PROCEDURAL REPRESENTATION AND AESTHETICS**

**PROGRAMMING/CODING IS NOT A MECHANICAL TASK  
BUT A CREATIVE ACT OF DYNAMIC COMMUNICATION  
THROUGH SYMBOLIC REPRESENTATION OF THE WORLD**



# ALGORITHM DESIGN RUNS IN 3 STEPS

- Dematerialization of a phenomenon into a set of components which describe it properly.
- Resolving that set into pure syntax of the chosen medium (removing the semantic layer).
- Translation of the syntax into a series of operations within the chosen medium (for example, within coding environment such as Processing).

**COUNTERINTUITIVE DISASSEMBLY OF EXPERIENCE**  
**EQUIVALENT TO**  
**CORE TECHNIQUE OF OBSERVATION-BASED**  
**DRAWING, PAINTING OR SCULPTURAL MODELLING**

# BROADER COGNITIVE ASPECTS

As a counterintuitive disassembly of experience  
algorithm design requires a spectrum of cognitive skills

- Sense for selecting an interesting/relevant phenomenon to algorithmize.
- Ability to assess if it can be algorithmized.
- Imagination and flexibility of reasoning.
- Distinguishing between rational and irrational elements of our concepts of natural phenomena and processes.
- Attention to the scope and limitations of the algorithmic system.

# CHALLENGES OF PROCEDURAL THINKING WITHIN NEW MEDIA ART

- Conceptual constraints of software and hardware architectures can impose certain solutions and spin the creative process.
- Fixed performative capabilities of the hardware can reflect in roughness and lack of spontaneity.
- Marius Watz writes about that in your RA 1.

## PLUS CURRENT ISSUES OF THE CREATIVE AI

- Various modes of anthropomorphizing (further reading Mitchell 2019).
- Translation of sociopolitical biases into training datasets.
- Misleading discourse about the capabilities and consequences of the AI.
- Misconceptions about the artistic creativity vis-a-vis the AI.
- Lack of ssensibility to the authentic creative potentials of the AI.

# CONCLUSION

Generative methodology requires

- Ingenuity.
- Multidisciplinary research.
- Critical understanding of accumulated knowledge.
- Continuous learning.

## TO LEVERAGE THE POTENTIALS OF GM WE NEED TO

- Understand its expressive requirements.
- Learn cognitive and technical skills.
- Be aware of its limitations within various media and tech environments.

# **EXAMPLES**

Dejan Grba - 2017 - Analogies

Dejan Grba and Philippe Kocher - 2019 - Study 7/0



**LOOK UP FOR NEXT CLASS**

**LINKS AND DETAILS AT THE OSS**

- EXAMPLES IN

CASEY REAS ET AL. - 2010 - FORM+CODE

(PDF BOOK + CODE EXAMPLES)

- MICHAEL NAJJAR - 2008-2010 - HIGH ALTITUDE

- ROMAN SIGNER

- WALTER DEMARIA - 1977 - LIGHTING FIELD

A black and white image of a fingerprint pattern, with the ridges and valleys creating a complex, wavy texture. The text "THANK YOU!" is centered in the middle of the image in a bold, white, sans-serif font.

**THANK YOU!**