

# Can a computer make us laugh?

## INFO-H-512 - Current trends in AI



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Introduction

Computational Creativity

Computational Humor

# Computational Humor

# Humor

The tendency of  
particular cognitive  
experiences to provoke  
laughter and provide  
amusement.

# Computational

~ The possibility of being modeled on a computer.

# Humor

The tendency of particular cognitive experiences to provoke laughter and provide amusement.

# Why computational humor?

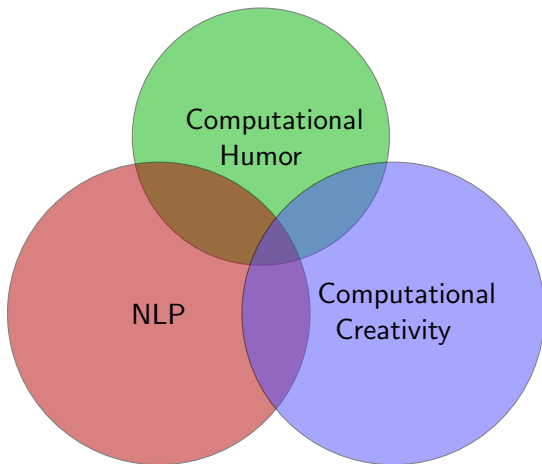
- On the human side humor:
  - Affects attention and memory.
  - Facilitates social interactions.
- Under a research point of view, humor modeling:
  - Is an *AI-complete* problem.
  - Could give insights into how humans process real, complex, creative language.

**Source:** [BNS<sup>+</sup>06],[SS03]

Which are the fields concerned?



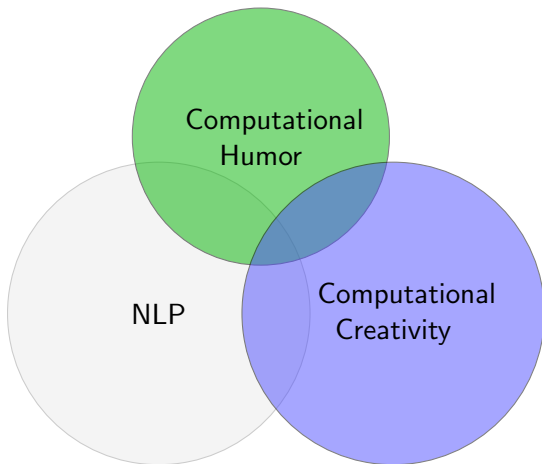
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Which are the fields concerned?



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# What is computational creativity?



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Computational creativity is the study and simulation, by computational means, of the behaviour, natural and artificial, which would, if observed in humans, be deemed creative.

from *The Association of Computational Creativity*

What is computational creativity?



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# How is creativity defined?



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## Definition

*"Creativity can be defined as the ability to generate novel and valuable ideas."*

**Source:** [Bod09],[Bod98]

# How is creativity defined?

## Definition

*"Creativity can be defined as the ability to generate **novel** and valuable ideas."*

## Novelty

- Psychological - P-Creativity
- Historical - H-Creativity

**Source:** [Bod09],[Bod98]

# How is creativity defined?

## Definition

*"Creativity can be defined as the ability to generate novel and **valuable** ideas."*

## Valuation

- Difficult to model
- Based on cultural and socially accepted style of thoughts.
- Subjective and dependant on motivation and emotional factors

**Source:** [Bod09],[Bod98]

How can creativity be achieved?



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# How can creativity be achieved?



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- By **combination**

- Direct association of concepts that were previously unlinked ( $\approx$  analogy)

**Source:** [Bod09],[Bod98]



# How can creativity be achieved?

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- ☐ Direct association of concepts that were previously unlinked ( $\approx$  analogy)

- By **exploration**

- ☐ of a conceptual space (style of thinking)
- ☐ defined by a set of generative rules

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A formal framework for the analysis of creative systems have been presented in [Wig06].

**Source:** [Bod09],[Bod98]

## Successful examples

### ■ **Combinational creativity**

- JAPE : A program for producing punning riddles [Bin96]

### ■ **Exploratory creativity**

- EMI : Experiments in musical intelligence [Cop91]
- Jazz improvisation in the style of Charlie Parker [Hod05]
- AARON : Line drawing and coloring painter [Coh95]
- BACON : Heuristic-based suite to model scientific discovery [Sta88]

### ■ **Transformational creativity**

- Automated Mathematician [Len83]
- Eurisko [Len83]

## Why CH is AI-Complete?

A successfully humorous computational system should be able to:

1. Recognize situations appropriate for humor.
2. Choose a suitable kind of humor for the situation.
3. Generate an appropriately humorous output.
4. (In case of interaction or control) Evaluate the feedback.

**Source:** [SS03]

# Which AI fields are concerned?



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## ■ Humor generation

- Choose a suitable kind of humor for the situation.
- Generate an appropriately humorous output.

## ■ Humor detection

- Recognize situations appropriate for humor.
- (In case of interaction or control) Evaluate the feedback.

Which AI fields are concerned?



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## ■ **Humor generation** $\mapsto$ **Computer Creativity**

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■ **Humor generation**  $\mapsto$  **Computer Creativity**

- Choose a suitable kind of humor for the situation.
- Generate an appropriately humorous output.

■ **Humor detection**  $\mapsto$  **NLP**

- Recognize situations appropriate for humor.
- (In case of interaction or control) Evaluate the feedback.



CH State-of-the-art

## Current research

### ■ Humor Production

- Humorous Agent for Humorous ACRONYMNs - European Project IST-2000-30039.
- Computational Humour for Creative Naming

### ■ Humor Recognition and Understanding

- Corpus-based methods for humor recognition

### ■ Humour in User Interfaces

Source: [MN02] [Nij12]

CH Research

## Future research

- Formal theory
- Multimodality
- Sociality and Evaluation

**Source:** [MN02] [Nij12]

# Applications

- A few programs implementing models of humor exists (cf. [MN02] [Nij12]).
- Unfortunately, they are mostly proofs of concept.
- Applications of computational humor can be foreseen in:
  - Advertisement (targeted)
  - Human-Computer Interaction

## Conclusions

### Computational Humor:





- Is a relatively new field of research ( $< 15$  years).
- Is based on humor research in psychology, philosophy, linguistics, sociology, history and literature as well as computational linguistics and artificial intelligence.
- May yield to a more emphatic and sociable HCI.
- Tries to understand (and thus model) the roots of creative language.

*"A conclusion is simply the place where you got tired of thinking."* -  
Anonymous

# Questions?



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