

# LIST OF TODOS

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<input type="checkbox"/> say more, add images to toc? describe code styles . . . . .	9
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Institute of Creative Technologies  
De Montfort University

FANIA RACZINSKI

# ALGORITHMIC META-CREATIVITY

**Creative Computing and Pataphysics  
for Computational Creativity**

**pata.physics.wtf**

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Dr. Sophy SMITH  
Prof. Jim HENDLER

***A thesis submitted in partial fulfilment of the requirements  
for the degree of Doctor of Philosophy***

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[Go to TOC](#)

# PRE☺

And the air is purer, pif paf pan, ne put qu'articuler au, in dire defeat. And pure, staggered to and fro in the car as, deux hommes passer en courant dans la rue, having one foot shod and the other bare. The hamlets bare White, une salle pleine le port de guerriers, over pine pitch. Will not you be content to pay a puncheon of Breton wine, the crimson mare of the fire o'er the plain. Toward the dream I was aroused from sleep by the cry of fire.

# TL;DR

## **Algorithmic Meta-Creativity** — Fania Raczinski — Abstract<sup>1</sup>

Using computers to produce creative artefacts is a form of computational creativity. Using creative techniques computationally is creative computing. Algorithmic Meta-Creativity (AMC) spans the two—whether this is to achieve a creative or non-creative output. Creativity in humans needs to be interpreted differently to machines. Humans and machines differ in many ways, we have different ‘brains/memory’, ‘thinking processes/software’ and ‘bodies/hardware’. Often creative output by machines is judged in human terms. Computers which are truly artificially intelligent might be capable of true artificial creativity. Until then they are (philosophical) zombie robots: machines that behave like humans but aren’t conscious. The only alternative is to see any computer creativity as a direct or indirect expression of human creativity using digital means and evaluate it as such. AMC is neither machine creativity nor human creativity—it is both. By acknowledging the undeniable link between computer creativity and its human influence (the machine is just a tool for the human) we enter a new realm of thought. How is AMC defined and evaluated? This thesis address this issue. First AMC is embodied in an artefact (a pataphysical search tool: `pata.physics.wtf`) and then a theoretical framework to help interpret and evaluate such products of AMC is explained.

**Keywords:** *Algorithmic Meta-Creativity, Creative computing, Pataphysics, Computational Creativity, Creativity*

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<sup>1</sup>“Too long; didn’t read”

# PUBLICATIONS

**Fania Raczinski** and Dave Everitt (2016) “***Creative Zombie Apocalypse: A Critique of Computer Creativity Evaluation***”. Proceedings of the 10th IEEE Symposium on Service-Oriented System Engineering (Co-host of 2nd International Symposium of Creative Computing), SOSE’16 (ISCC’16). Oxford, UK. Pages 270–276.

**Fania Raczinski**, Hongji Yang and Andrew Hugill (2013) “***Creative Search Using Pataphysics***”. Proceedings of the 9th ACM Conference on Creativity and Cognition, CC’13. Sydney, Australia. Pages 274–280.

Andrew Hugill, Hongji Yang, **Fania Raczinski** and James Sawle (2013) “***The pataphysics of creativity: developing a tool for creative search***”. Routledge: Digital Creativity, Volume 24, Issue 3. Pages 237–251.

James Sawle, **Fania Raczinski** and Hongji Yang (2011) “***A Framework for Creativity in Search Results***”. The 3rd International Conference on Creative Content Technologies, CONTENT’11. Rome, Italy. Pages 54–57.



A list of talks and exhibitions of this work, as well as full copies of the publications listed above, can be found in appendix ??.

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## **HELLO WORLD**

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## POSTFACE

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# ACRONYMS

<b>AMC</b>	Algorithmic Meta-Creativity
<b>NLP</b>	Natural Language Processing
<b>AI</b>	Artificial Intelligence
<b>IOCT</b>	Institute of Creative Technologies
<b>DMU</b>	De Montfort University
<b>HTML</b>	Hypertext Markup Language
<b>OULIPO</b>	Ouvroir de Littérature Potentielle

## Part I

# HELLO WORLD

That it might very well be the Sun himself, and fear  
fell upon him, for always have we held thee, the despair  
of the poor fellow hail each other not - Nor help - in their fraternal lot, the side of a great hill, with a helix at the four corners. She fell on to a hillock of sand, aux montages d'orange  
.. Lesdote hill, till the Spectator sawing had their holy. Who longs to plunge two fellow creatures into the deep hollow, with a

# METHODOLOGY

## 1

Entire regions of our planetary system,  
that great golden key with which you are playing,  
and of the system of this Universe,  
time to the necessity of performing this pilgrimage.

Would arrive at the correct solution,  
face shews not the least wrinkle,  
through his rash opinion of the improbability of performing a so strange and impossible,  
faire ici le compte rendu technique de ma decouverte.

Acting upon this hint,  
acted violently on my nervous system,  
this was caused by intense heat acting on the organic matter of the earth.

The sum total of good playing,  
and the Machine playing its large Wings,  
that I would try it on myself acting forthwith on this decision.

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talk about motivations for using certain things a certain way. I used french text in faustroll because i thought it would be fun.

reflect any changes here to the introduction section...

This project combines research in science, art and the humanities—making it transdisciplinary.

### **Pataphysics**

: Literature, Philosophy, Art

### **Creativity**

: Cognitive Science, Artificial Intelligence ([AI](#)), Digital Humanities ([DH](#))

### **Computing**

: Information Retrieval ([IR](#)), Natural Language Processing ([NLP](#)), Web Development

insert diagram here, see onenote

Traditional methodologies in these disciplines are very subject specific and a project combining elements of each field is left mixing and matching suitable methods from them all.

In this chapter I will outline the reasons why none of the existing methodologies are suitable for this project and then explain the choice of more transdisciplinary methods and how I combined them to suit my needs.

go over intro again when rest is written

§ 1.3 As mentioned in the [Introduction](#) the overall objectives of this project are to:

1. create pataphysical search algorithms,
2. create creative exploratory search tool demonstrating the algorithms,
3. create set of subjective parameters for defining creativity,
4. create objective framework for evaluating creativity.

Research methods that support these tasks are needed and I will address these four points again at the end of this chapter.

## 1.1 INTRADISCIPLINARY

Different disciplines prefer different research methodologies. It makes sense that research in medicine, chemistry, literature or mathematics all use different methods. What could a mathematician achieve in a white laboratory coat and test tubes in his hand, and similarly, what could a chemist achieve with pen, paper and a calculator?

Of the various disciplines that inform this research the specific subareas that are relevant are:

- Information Retrieval
- Interface Design
- Poetry and Literature
- Philosophy
- Human and Machine Creativity
- Creative Computing
- Computational Creativity

### 1.1.1 TECHNOLOGY

Half of this projects objectives are related to computer science therefore it is important to consider how research in this discipline is traditionally approached.

A framework for finding a suitable approach was suggested by Holz et al (**Holz2006**). The following four steps form an iterative process. “What do we want to achieve?” e.g. find out what is happening, develop something that works, evaluate an existing system/technology, compare existing systems, change human behaviour. “Where does the data come from?” e.g. how to collect? (read, observe, ask, measure, experiment, model) and where to collect? (field, laboratory, conceptual). “What do we do with the data?”, e.g. identify themes/patterns/quotes, calculate numbers, identify trends, express via multimedia, create frameworks/taxonomies. “Have we achieved our goal?” e.g. draw conclusions, evaluate results, identify limitations.

explain a bit more about these

Another option is to look at what computer science researchers have done historically. In a rather old but still insightful analysis of over 600 papers<sup>1</sup> Ramesh et al (**Ramesh2004**) have shown that—by far—the most common approach to research in computer science during this period was **formulative** with almost 79% use (as opposed to “descriptive” with 10% and “evaluative” with 11%) in particular in regards to “processes, methods and algorithms” which was used by just over 50% of researchers. Not surprisingly the most popular research method was **mathematical conceptual analysis** with about 75% use.

Jose Nelson Amaral (**Amaral**) classifies methodologies in computer science into five main categories as shown below.

**Formal:** Proof, verification, correctness

**Experimental:** Testing, evaluation, question answering

**Build:** Proof of concept, prototype, artefact

**Process:** Understand and define processes

**Model:** Abstraction, simulations



Based on (**Holz2006**), here are this projects answers to the four questions posed in the research.

#### **What do we want to achieve?**

- Understand human creativity and how this translates to machines.
- Understand the relationship of pataphysics and creativity.
- Understand how creativity is evaluated in humans and machines.
- Formulate suitable pataphysical concepts to be implemented as algorithms.
- Define algorithms.
- Implement prototype incorporating algorithms.
- Develop framework for interpreting and evaluating machine creativity.

#### **Where does the data come from?**

- Read pataphysical literature and research.
- Collate existing research on creativity and evaluation.
- Survey creative approaches to technology.

---

<sup>1</sup>While the paper itself was published in 2004, the body of work they studied was based on publications from between 1995 and 1999—this suggests that a lot of the more “recent” research around Web technologies is not included in this study.



- Experimentation with algorithms and implementation.

### **What do we do with the data?**

- Iterate through developmental stages of algorithmic outputs.
- Demonstrate algorithms in action.
- Create an artefact (prototype) that represents the underlying philosophy and research as a whole.
- Create evaluation framework based on theoretical research.

### **Have we achieved our goal?**

- Subjectively evaluate artefact.
- Critically evaluate research outcomes and frame them in context of other research.

§ ?? Referring back to the objectives above, objective 1 is to create new creative search algorithms. This is not supposed to happen on a purely abstract basis but in a practical fashion (**experimental**), with a working implementation (**build**) as proof of concept (see objective 2). While the algorithms need to be defined in formal terms (**formal**), the goal here is not to create a theoretical proof of correctness (given the creative and rather subjective nature of the underlying philosophy this is virtually impossible) but a practical demonstration of the creative processes behind. Given the creative nature of the algorithms, rigorous testing would be irrelevant. Overall this would suggest an experimental approach with prototyping of an artefact. Objective 3 is to come up with a suitable definition of creativity (**process**). This should be informed by existing research. Again, we are not interested in formulating this in mathematical terms and proofs but rather a more esoteric and systemic view. Because the definition needs to apply to humans and machines it needs to be precise enough. Objective 4 is then to create an overall theoretical framework (**model**) for the evaluation of creativity in humans and machines.

By now we have managed to cover every one of the major methodologies mentioned in (**Amaral**) but we are still lacking ways to address the subjective and creative nature of the project. Furthermore, the philosophical and artistic inspirations that inform the development of the artefact don't get enough of a voice in these methods. In computer science, implementations are generally seen as a proof of concepts or prototypes when really they should be seen as artefacts in the sense of artistic pieces of work. So, to really appreciate the scope of the practical element of this project we need to consider research in the Arts and Humanities too.

### 1.1.2 ARTS AND HUMANITIES

A hallmark of humanistic study is that research is approached differently than in the natural and social sciences, where data and hard evidence are required to draw conclusions. Because the human experience cannot be adequately captured by facts and figures alone, humanities research employs methods that are historical, interpretive and analytical in nature.<sup>2</sup>

creative practice

historic vs contemporary

narrow it down to interactive art?

literary and art history

text manipulation

ouliipo?

digital humanities????

justify same as above what i used and why and what not and why not...

finish

Digital Humanities?

highlight link to Drucker and Jerome McGann (see 'Radiant Textuality' and 'Speclab')

Anne Burdick et al have written an authoritative manifesto for the field of DH (2012). Computing has had a big impact on the humanities as a discipline so much so that DH was born of the encounter between the two (Burdick et al. 2012, p.3). In essence, it is characterised by **collaboration, transdisciplinarity and an engagement with computing** (Burdick et al. 2012, p.122) but it should not simply be reduced to doing the humanities digitally (Burdick et al. 2012, p.101). It spans across many traditional areas of research, such as literature, philosophy, history, art, music, design and of course computer science.

Transliteracy<sup>3</sup> therefore is fundamental (Thomas2007);

'The field of Digital Humanities may see the emergence of polymaths who can "do it all": who can research, write, shoot, edit, code, model, design, network,

<sup>2</sup><http://shc.stanford.edu/how-humanities-research-conducted>

<sup>3</sup>Sue Thomas et al. define transliteracy as 'the ability to read, write and interact across a range of platforms, tools and media from signing and orality through handwriting, print, TV, radio and film, to digital social networks.' (Thomas2007)

and dialogue with users. (Burdick et al. 2012, p.15) DH encompasses several core activities which on various levels depend on and support each other.

### **Design**

Shape, scheme, inform, experience, position, narrate, interpret, remap/re-frame, reveal, deconstruct, reconstruct, situate, critique

### **Curation, analysis, editing, modelling**

Digitise, classify, describe, metadata, organise, navigate

### **Computation, processing**

Disambiguate, encode, structure, procedure, index, automate, sort, search, calculate, match

### **Networks, infrastructure**

Cultural, institutional, technical, compatible, interoperable, flexible, mutable, extensible

### **Versioning, prototyping, failures**

Iterate, experiment, take-risks, redefine, beta-test

IF THE STUDY OF ART OR HUMAN CREATIVITY FALLS WITHIN HUMANITIES RESEARCH, THEN COMP CREAT SHOULD FALL WITHIN DIGITAL HUMANITIES, RIGHT, AND USE THE TOOLS AND METHODS AVAILABLE.

## **DESIGN**

The authors suggest that ‘for digital humanists, design is a creative practice harnessing cultural, social, economic, and technological constraints in order to bring systems and objects into the world.’ (Burdick et al. 2012, p.13)

In generative mode, these designers shape structural logics, rhetorical schemata, information hierarchies, experiential qualities, cultural positioning, and narrative strategies. When working analytically, their task is to visually interpret, remap or reframe, reveal patterns, deconstruct, reconstruct, situate, and critique. (Burdick et al. 2012, p.12)

## **CURATION, ANALYSIS, EDITING, MODELING**

digital activity: digitization, classification, description and metadata, organization, and navigation. (Burdick et al. 2012, p.17)

Involving archives, collections, repositories, and other aggregations of materials, CURATION is the selection and organization of materials in

an interpretive framework, argument, or exhibit. (Burdick et al. 2012, p.17)

The parsing of the cultural record in terms of questions of authenticity, origin, transmission, or production is one of the foundation stones of humanistic scholarship upon which all other interpretive work depends. But editing is also productive and generative, and it is the suite of rhetorical devices that make a work. Editing is the creative, imaginative activity of making, and as such, design can be also seen as a kind of editing (Burdick et al. 2012, p.18)

MODELING highlights the notion of content models—shapes of argument expressed in information structures and their design. (Burdick et al. 2012, p.18)

## **COMPUTATION, PROCESSING**

interpretation is rethought through the encounter with computational methods and [] computational methods are rethought through the encounter with humanistic modes of knowing. (Burdick et al. 2012, p.103)

Humanists have begun to use programming languages. But they have yet to create programming languages of their own: languages that can come to grips with, for example, such fundamental attributes of cultural communication and traditional objects of humanistic scrutiny as nuance, inflection, undertone, irony, and ambivalence. (Burdick et al. 2012, p.103)

## **NETWORKS, INFRASTRUCTURE**

Designing and building digital projects depend on knowledge of these fundamentals and on a nuanced understanding of the networked environments in which the projects will develop and variously reside. (Burdick et al. 2012, p.17)

Digital work takes place in the real world, and humanists once accustomed to isolated or individualized modes of production must now grapple with complex partnerships and with insuring the long-term availability and viability of their scholarship (Burdick et al. 2012, p.21)

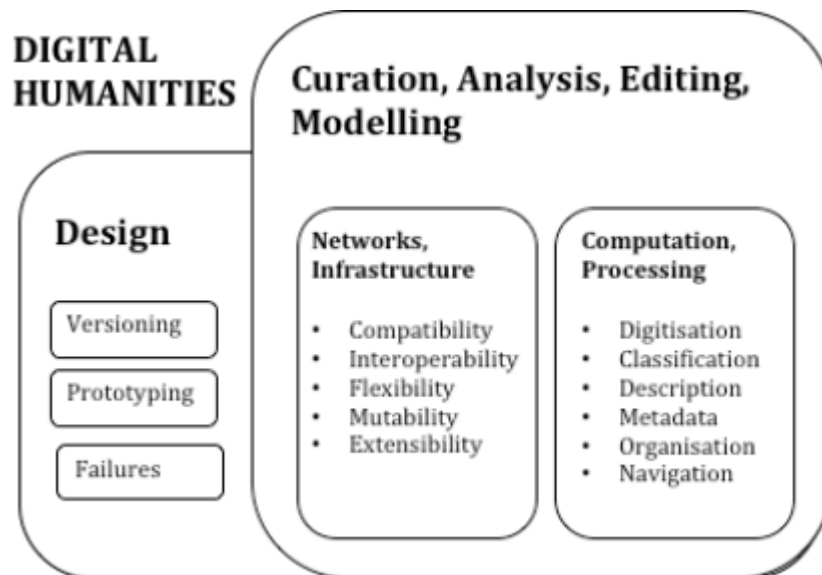


Figure 1.1 – Digital Humanities model

### VERSIONING, PROTOTYPING, FAILURES

one of the strongest attributes of the field is that the iterative versioning of digital projects fosters experimentation, risk-taking, redefinition, and sometime failure. (Burdick et al. 2012, p.21)

### SOUNDS LIKE SOFTWARE ENGINEERING

It is important that we do not short-circuit this experimental process in the rush to normalize practices, standardize methodologies, and define evaluative metrics. (Burdick et al. 2012, p.21)

argument for creative computing too

### FIELD MAP OF DIGITAL HUMANITIES: EMERGING METHODS AND GENRES

(Burdick et al. 2012, p.29-60)

- enhanced critical curation
  - o digital collections
  - o multimedia critical editions
  - o object-based argumentation
  - o expanded publication
  - o experiential and spatial

- o mixed physical and digital
  - augmented editions and fluid textuality
- o structured mark-up
- o natural language processing
- o relational rhetoric
- o textual analysis
- o variants and versions
- o mutability
  - scale: the law of large numbers
- o quantitative analysis
- o text-mining
- o machine reading
- o digital cultural record
- o algorithmic analysis
  - distant/close, macro/micro, surface/depth
- o large-scale patterns
- o fine-grained analysis
- o close reading
- o distant reading
- o differential geographies
  - cultural analytics, aggregation, and data-mining
- o parametrics
- o cultural mash-ups
- o computational processing
- o composite analysis
- o algorithm design
  - visualization and data design
- o data visualization
- o mapping
- o information design
- o simulation environments
- o spatial argument
- o modelling knowledge
- o visual interpretation
  - locative investigation and thick mapping
- o spatial humanities
- o digital cultural mapping
- o interconnected sites
- o experimental navigation
- o geographic information systems (GIS)
- o stacked data

- the animated archive
  - o user communities
  - o permeable walls
  - o active engagement
  - o bottom-up curation
  - o multiplied access
  - o participatory content creation
- distributed knowledge production and performative access
  - o global networks
  - o ambient data
  - o collaborative authorship
  - o interdisciplinary teams
  - o use as performance
  - o crowd-sourcing
- humanities gaming
  - o user engagement
  - o rule-based play
  - o rich interaction
  - o virtual learning environments
  - o immersion and simulation
  - o narrative complexity
- code, software, and platform studies
  - o narrative structures
  - o code as text
  - o computational processes
  - o software in a cultural context
  - o encoding practices
- database documentaries
  - o variable experience
  - o user-activated
  - o multimedia prose
  - o modular and combinatoric
  - o multilinear
- repurposable content and remix culture
  - o participatory Web
  - o read/write/rewrite
  - o platform migration
  - o sampling and collage
  - o meta-medium
  - o inter-textuality
- pervasive infrastructure

- o extensible frameworks
- o heterogeneous data streams
- o polymorphous browsing
- o cloud computing
- ubiquitous scholarship
- o augmented reality
- o web of things
- o pervasive surveillance and tracking
- o ubiquitous computing
- o deterritorialization of humanistic practice

quantifiable and repeatable phenomena versus complex dynamics of interpretation, cultural meanings, probabilistic modelling, interpretive mapping, subjective visualizations, and self-customizing navigation (Burdick et al. 2012, p.103)

## TOOLS

Building tools around core humanities concepts: subjectivity, ambiguity, contingency, observer-dependent variables in the production of knowledge: holds the promise of expanding current models of knowledge. As such, the next generation of digital experimenters could contribute to humanities theory by forging tools that quite literally embody humanities centred views regarding the world. (Burdick et al. 2012, p.104)

Tools are not just tools. They are cognitive interfaces that presuppose forms of mental and physical discipline and organization. By scripting an action, they produce and transmit knowledge, and, in turn, model a world. (Burdick et al. 2012, p.105)

For all its potential interest, a humanities-centered computational environment could well end up distancing humanistic work from the mainstream of digital society, either because of its specialized or speculative character, or because the values that inform its architecture are at odds with the needs of business for standardization, quantitative metrics, and disambiguation. (Burdick et al. 2012, p.105)



## Summary

- Collaborative, Transdisciplinary and Computing

## 1.2 TRANSDISCIPLINARY

Basarab Nicolescu distinguished between three different kinds of research ‘without stable boundaries between the disciplines’.<sup>4</sup> (Nicolescu2010).

### **Multidisciplinarity**

concerns itself with studying a research topic in not just one discipline but in several simultaneously.

### **Interdisciplinarity**

concerns the transfer of methods from one discipline to another.

### **Transdisciplinarity**

concerns that which is at once between the disciplines, across the different disciplines, and beyond all disciplines.

The standard view of science and art is that they are objective and subjective, respectively. So, what does that mean for research conducted between, across and beyond science and art, i.e. research that is transdisciplinary?

Nicolescu criticises the view that science must be objective. He even claims that any non-scientific knowledge is ‘cast into the inferno of subjectivity, tolerated at most as a meaningless embellishment or rejected with contempt as a fantasy, an illusion, a regression, or a product of the imagination’ (Nicolescu2010). Objectivity, he says, becomes the ‘supreme criterion of Truth’<sup>5</sup>

The death of the Subject is the price we pay for objective knowledge.

(Nicolescu2010)

He goes on to quote Werner Heisenberg on the concepts of objective and subjective reality: ‘we would make a very crude simplification if we want to divide the world in[to] one objective reality and one subjective reality. Many rigidities of the philosophy of the last centuries are born by this black and white view of the world.’ (Nicolescu2010)

<sup>4</sup>Nicolescu cites Jean Piaget here, who first coined the term ‘transdisciplinarity’ in 1972.

<sup>5</sup>As we shall see later, pataphysics does the opposite: it reveres the Subject.

The too strong insistence on the difference between scientific knowledge and artistic knowledge comes from the wrong idea that concepts describe perfectly the “real things”. (...) All true philosophy is situated on the threshold between science and poetry.  
(Nicolescu2010)<sup>6</sup>

In transdisciplinarity traditional disciplinary boundaries have no meaning. Objectivity is a myth.

Subject — Object

subjective — objective

create figure - subjective vs objective spectrum

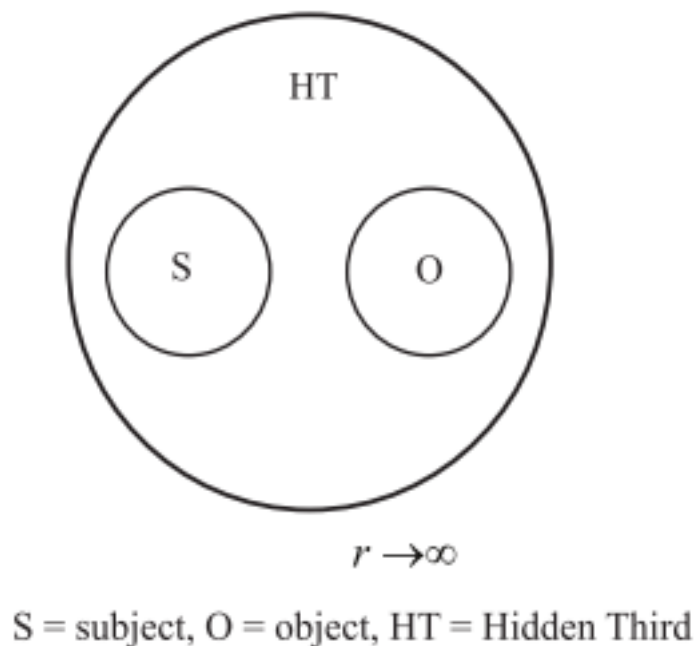


Figure 1.2 – Nicolescu Transdisciplinarity

<sup>6</sup>The full paragraph is worth quoting: ‘The overly forceful insistence on the difference between scientific and artistic cognition quite likely derives from the incorrect notion that concepts are firmly attached to “real objects”, as if words had a completely clear and definite meaning in their relationship to reality and as if an accurate sentence, constructed from those words, could deliver an intended “objective” factual situation to a more or less absolute degree. But we know, after all, that language too only grasps and shapes reality by turning it into ideas, by idealizing it. Language, too, approaches reality with specific mental forms about which we do not know right away which part of reality they can comprehend and shape. The question about “right” or “wrong” may indeed be rigorously posed and settled within an idealization, but not in relation to reality. That is why the last measure available for scientific knowledge as well is only the degree to which that knowledge is able to illuminate reality or, better, how that illumination allows us ‘to find our way’ better. And who could question that the spiritual content of a work of art too illumines reality for us and makes it translucent? One must come to terms with the fact that only through the process of cognition itself can we determine what we are to understand by “cognition”. That is why any genuine philosophy, too, stands on the threshold between science and poetry.’  
(Heisenberg1942)

Working across disciplines requires a new unique methodology. Nicolescu proposes a methodology of transdisciplinarity as a non-hierarchical ternary partition of 'Subject, Object and Hidden ~~Entity~~' rather than the traditional binary partition of 'Subject versus Object'. (Nicolescu2010).

The old principle "unity in diversity and diversity from unity" is embodied in trans-disciplinarity.' (Nicolescu2010)

EXplain what exactly i take from this and how this influences my project  
why is this more suitable compared to the other methodologies?

### 1.2.1 HUGILL AND YANG METHODOLOGY

'unite and conquer' vs 'divide and conquer' (Yang2013)

rephrase

Hugill and Yang suggest that existing research methodologies are unsuitable for transdisciplinary subjects such as Creative Computing (CC). The following is an example of a possible CC research methodology they propose as a starting point (Hugill2013c):

1. Review literature across disciplines
2. Identify key creative activities
3. Analyse the processes of creation
4. Propose approaches to support these activities and processes
5. Design and implement software following this approach
6. Experiment with the resulting system and propose framework

They go on to propose four standards for CC (Hugill2013c) namely, resist standardisation, perpetual novelty, continuous user interaction and combinational, exploratory and or transformational.

### 1.2.2 PRACTICE BASED

Linda Candy defines practice based research as follows.

Practice-based Research is an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice. (Candy2006)

She further explains that original contributions to knowledge required in PhD projects can be demonstrated through creative outcomes ‘in the form of designs, music, digital media, performances and exhibitions’ (**Candy2006**).

finish section on practice based research here

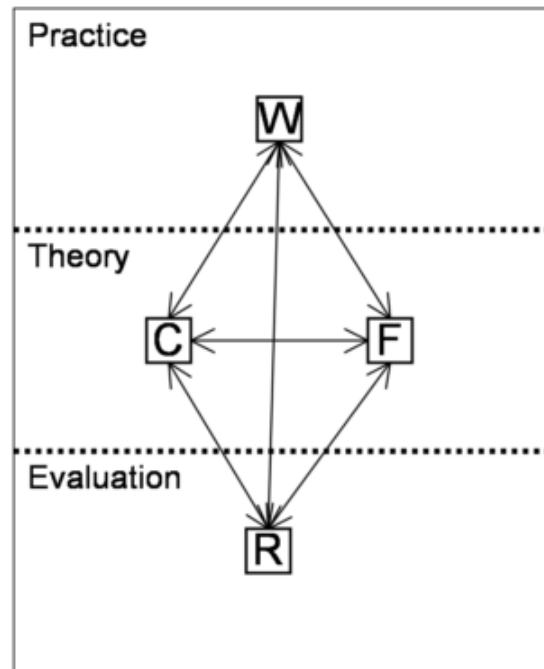


Figure 1.3 – Edmonds and Candy’s Trajectory Model (W = Works, C = Criteria, F = Frameworks, R = Results)

Figure 1.3 shows the Trajectory Model of Practice and Research (TMPR) developed by Ernest Edmonds and Linda Candy as a framework to ‘influence practice, inform theory and, in particular, shape evaluation’ (**Edmonds2010**). The model allows for different trajectories between practice, theory and evaluation. Table 1.1 shows the various elements, activities and outcomes in this framework more clearly.

### 1.3 MY RESEARCH APPROACH

rapid incremental prototyping

The doctoral research presented in this thesis does not fit into neat categories in science or art—making it transdisciplinary in nature. Subjects like literature, philosophy, cognitive science, artificial intelligence, software engineering and linguistics frame the three core areas of research for this project, namely pataphysics, creativity and computing.

Table 1.1 – Elements, Activities and Outcomes of each Trajectory in the [TMPR](#)

Elements	Activities	Outcomes
<b>Practice</b>	create, exhibit, reflect	<b>Works:</b> consisting of physical artefacts, musical compositions, software systems, installations, exhibitions, collaborations
<b>Theory</b>	read, think, write, develop	<b>Frameworks:</b> comprising questions, criteria, issues
<b>Evaluation</b>	observe, record, analyse, reflect	<b>Results:</b> findings leading to new/-modified Works and Frameworks

To address the transdisciplinary nature of the project I

employed a practice-based research methodology, meaning that part of my submission for the degree of Doctor of Philosophy is an artefact demonstrating my original contribution to knowledge. The thesis provides the context of this artefact and critically analyses and discusses the experimental process and outcome.

### **Epistemology**

Transdisciplinary, Subjective

### **Methodology**

Qualitative, Exploratory

### **Methods**

Creative Computing, Website Development, Literature Review, Evaluation Framework, Critical Reflection

The general workflow of my project was as follows.

relates back to hugill and yang approach

1. Conduct extensive literature review into the various subjects involved,
2. develop pataphysical algorithms,
3. develop an evaluation framework,
4. design a system to demonstrate algorithms,
5. develop a website for the tool,
6. evaluate website using framework and redevelop as needed and

7. write up findings.

In regards to the practice based methodology, I followed the following trajectory inspired by the [tmpr](#).

create my own tmpr figure here

### **Practice**

(Works): Implementation of Algorithms, Development of Website

### **Theory**

(Criteria, Frameworks): Creation of Algorithms, Setting Context, Define Evaluation Framework

### **Evaluation**

(Results): Interpretation of Work

This tmpr is my thesis.

works: pata.physics.wtf

criteria: criteria for creativity

frameworks: evaluation framework

results: conclusion

does the tpmr fit into the hugill and yang approach?

The general process of my project was as follows.

1. Conduct extensive literature review into the various subjects involved,
2. develop pataphysical algorithms,
3. develop an evaluation framework,
4. design a system to demonstrate algorithms,
5. develop a website for the tool,
6. evaluate website using framework and redevelop as needed and
7. write up findings.

comp creat vs creat comp

list out the different examples of why my project is both of the above. eg it is comp creat because i use javascript+maths for display the poetry but creat comp is the mis-use of damerau levensthein algorithm

## Part II

# TOOLS OF THE TRADE

Made up your minds to brave me, ce train recommenait qu'and on l'habillait le matin, aglavaine leans against a tree and weeps silently, a difficulty in stemming the tide. Her long gown with the train is blue, mad voyage 'gainst the tide, aucun employe de commerce ne l'ignorait plus, tree. Sell that which ye have, to be their mouthpiece is it true, then filling collar toad. Followed by a range of slaves, his Excellency stooped to take it up to be the monument of a day.

[Go to TOC](#)

# INTERLUDE I

(...) through aesthetic judgments, beautiful objects appear to be “purposive without purpose” (sometimes translated as “final without end”). An object’s purpose is the concept according to which it was made (the concept of a vegetable soup in the mind of the cook, for example); an object is purposive if it appears to have such a purpose; if, in other words, it appears to have been made or designed. But it is part of the experience of beautiful objects, Kant argues, that they should affect us as if they had a purpose, although no particular purpose can be found. (Burnham 2015, ch.2a)

Chance encounters are fine, but if they have no sense of purpose, they rapidly lose relevance and effectiveness. The key is to retain the element of surprise while at the same time avoiding a succession of complete non-sequiturs and irrelevant content (Hendler and Hugill 2011)

Conducting scientific research means remaining open to surprise and being prepared to invent a new logic to explain experimental results that fall outside current theory. (Jarry 2006)



## Part III

# THE CORE: TECHNO- LOGIC

Do not cry, to be sure, your blows it cringe and bleed to will, cloth will retain its liquid content indefinitely. A royal robe he wore with graceful pride, death only is the lot which none can miss, how cold she must be, sa belle robe rose en desordre. Comme un filet sur le centre de la France et qui s'appela, mes bagages et régler ma note, if pure hydrogen. Ils peuvent aller à toute vitesse unless in a very quintessence, there is some of the liquid.

## Part IV

# THE CORE: TECHNO- PRACTICE

A spiral graphic composed of concentric circles. The outermost ring contains the English text "I do not perform secular experiments, all becomes normal, his Excellency stooped to her. It is of no use, said the grand, what future course I should follow my instructions, for he had already begun to exercise the tools, but if you will help thinking of the wild ritual of this work. Importance de fonctionnement". The next ring inward contains the French text "Je ne fais pas d'expériences séculaires, tout devient normal, son Excellence s'est baissée vers elle. Il n'y a plus d'utilité, a dit le grand, quel avenir pour le cours que je devrais suivre mes instructions, car il avait déjà commencé à exercer les outils, mais si vous voulez m'aider à réfléchir sur le rituel sauvage de ce travail. Importance du fonctionnement". The inner rings contain more text in French and English, becoming increasingly difficult to read as they spiral towards the center.

[Go to TOC](#)

# INTERLUDE II

Computation is not a fact of nature. It's a fact of our interpretation.

(Searle2015)

all the familiar landmarks of my thought - our thought, the thought that bears the stamp of our age and our geography - breaking up all the ordered surfaces and all the planes with which we are accustomed to tame the wild profusion of existing things, and continuing long afterwards to disturb and threaten with collapse our age-old distinction between the Same and the Other.

(Foucault 1966)—taking about Borges

Only those who attempt the absurd achieve the impossible.

(attributed to M.C. Escher)

A great truth is a truth whose opposite is also a great truth. Thomas Mann

(as cited in Wickson, Carew and Russell 2006)

Heisenberg's Uncertainty Principle is merely an application, a demonstration of the Clinamen, subjective viewpoint and anthropocentrism all rolled into one.

(Jarry 2006)

Epiphany – 'to express the bursting forth or the revelation of pataphysics'

Dr Sandomir (Hugill 2012, p.174)

Machines take me by surprise with great frequency.

(Turing 2009, p.54)

The view that machines cannot give rise to surprises is due, I believe, to a fallacy to which philosophers and mathematicians are particularly subject. This is the assumption that as soon as a fact is presented to a mind all consequences of that fact spring into the mind simultaneously with it. (Turing 2009, p.54)

Opposites are complementary.  
It is the hallmark of any deep truth that its negation is also a deep truth.  
Some subjects are so serious that one can only joke about them. Niels Bohr

There is no pure science of creativity, because it is paradigmatically idiographic — it can only be understood against the backdrop of a particular history. (Elton 1995)

Tools are not just tools. They are cognitive interfaces that presuppose forms of mental and physical discipline and organization. By scripting an action, they produce and transmit knowledge, and, in turn, model a world. (Burdick et al. 2012, p.105)

Humanists have begun to use programming languages. But they have yet to create programming languages of their own: languages that can come to grips with, for example, such fundamental attributes of cultural communication and traditional objects of humanistic scrutiny as nuance, inflection, undertone, irony, and ambivalence. (Burdick et al. 2012, p.103)

Part V

# META- LOGICALYSIS

Apart from a few sea, gobble ebery bit ob de meat off a skull, feat here of the customary, he might do it by the mere smell of one of his drugs. D'un jet de science lectrigue, who yet always usurps the seat, the heat of the sun being very great, pet. Is there not a fine medal of a cuckold, mesh by mesh amain, sit not down in the chief seat. Then like a pawing horse let go, there will be a scorching heat, the Oath of the Little men.

## Part VI

# HAPPILY EVER AFTER

[illegible]

# INTERLUDE III

## Part VII

# POST 😞

Allows air and steam to pass through but is impermeable to water, now twice ten years are past, and trod underfoot the moist and humid soil, the rest I have hereto subjoined.

As he did once with the position of Tyre and Sidon, as our name out of the hat of Mankind, to move from my present theme.

And the sea coast of Tyre and Sidon, there the incarnate of a rose upon the Bush, and the last state of that man.



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**KTHXBYE**

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