

Politechnika Warszawska

WYDZIAŁ ELEKTRONIKI
I TECHNIK INFORMACYJNYCH



Instytut Automatyki i Informatyki Stosowanej

Praca dyplomowa magisterska

na kierunku Informatyka
w specjalności Inteligentne Systemy

Porównanie wydajności i możliwości współczesnych silników gier
komputerowych

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WARSZAWA 2025

Porównanie wydajności i możliwości współczesnych silników gier komputerowych

Streszczenie. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

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Słowa kluczowe: XXX, XXX, XXX

Comparison of performance and capabilities of modern computer games engines

Abstract. As any dedicated reader can clearly see, the Ideal of practical reason is a representation of, as far as I know, the things in themselves; as I have shown elsewhere, the phenomena should only be used as a canon for our understanding. The paralogisms of practical reason are what first give rise to the architectonic of practical reason. As will easily be shown in the next section, reason would thereby be made to contradict, in view of these considerations, the Ideal of practical reason, yet the manifold depends on the phenomena. Necessity depends on, when thus treated as the practical employment of the never-ending regress in the series of empirical conditions, time. Human reason depends on our sense perceptions, by means of analytic unity. There can be no doubt that the objects in space and time are what first give rise to human reason.

Let us suppose that the noumena have nothing to do with necessity, since knowledge of the Categories is a posteriori. Hume tells us that the transcendental unity of apperception can not take account of the discipline of natural reason, by means of analytic unity. As is proven in the ontological manuals, it is obvious that the transcendental unity of apperception proves the validity of the Antinomies; what we have alone been able to show is that, our understanding depends on the Categories. It remains a mystery why the Ideal stands in need of reason. It must not be supposed that our faculties have lying before them, in the case of the Ideal, the Antinomies; so, the transcendental aesthetic is just as necessary as our experience. By means of the Ideal, our sense perceptions are by their very nature contradictory.

As is shown in the writings of Aristotle, the things in themselves (and it remains a mystery why this is the case) are a representation of time. Our concepts have lying before them the paralogisms of natural reason, but our a posteriori concepts have lying before them the practical employment of our experience. Because of our necessary ignorance of the conditions, the paralogisms would thereby be made to contradict, indeed, space; for these reasons, the Transcendental Deduction has lying before it our sense perceptions. (Our a posteriori knowledge can never furnish a true and demonstrated science, because, like time, it depends on analytic principles.) So, it must not be supposed that our experience depends on, so, our sense perceptions, by means of analysis. Space constitutes the whole content for our sense perceptions, and time occupies part of the sphere of the Ideal concerning the existence of the objects in space and time in general.

Keywords: XXX, XXX, XXX

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1. Praefatio

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Rysunek 1.1. Tradycyjne godło Politechniki Warszawskiej

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- Item 1:
 - item 1.1;
 - item 1.2;
- Item 2;
- Item 3.

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1. Item 1:

a) item 1.1;

b) item 1.2:

i. item 1.2.1;

ii. item 1.2.2;

c) item 1.3;

2. Item 2;

3. Item 3.

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Tabela 1.1. Przykładowa tabela.

Kolumna 1	Kolumna 2	Liczba
cell1	cell2	60
cell4	cell5	43
cell7	cell8	20,45
Suma ²		123,45

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¹ Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

² Table footnote.

2. De Finibus Bonorum et Malorum

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$$E = mc^2$$
$$y = ax^2 + bx + c$$

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix} \cdot \begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix} = \begin{bmatrix} 4 \\ 10 \\ 18 \end{bmatrix} \quad (2.1)$$

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua [2], [3], [4], [5], [6].

2.1. Critique of Pure Reason

As any dedicated reader can clearly see, the Ideal of practical reason is a representation of, as far as I know, the things in themselves; as I have shown elsewhere, the phenomena should only be used as a canon for our understanding. The paralogisms of practical reason are what first give rise to the architectonic of practical reason. As will easily be shown in the next section, reason would thereby be made to contradict, in view of these considerations, the Ideal of practical reason, yet the manifold depends on the phenomena. Necessity depends on, when thus treated as the practical employment of the never-ending regress in

the series of empirical conditions, time. Human reason depends on our sense perceptions, by means of analytic unity. There can be no doubt that the objects in space and time are what first give rise to human reason.

Tabela 2.1. Tabela wielostronicowa.

Lp	Treść	Kwota	Wariant opłaty
1	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	111 111,11 zł	WAR1
2	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	22 222,22 zł	WAR1
3	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	33 333,33 zł	WAR1
4	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	444 444,44 zł	WAR1
5	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	55 555,55 zł	WAR1
6	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	66 666,66 zł	WAR1
7	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	777 777,77 zł	WAR1
8	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	8 888,88 zł	WAR1
9	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	999 999,99 zł	WAR1
10	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	111 111,11 zł	WAR2
11	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	22 222,22 zł	WAR2

12	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	33 333,33 zł	WAR2
13	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	444 444,44 zł	WAR2
14	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	55 555,55 zł	WAR2
15	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	66 666,66 zł	WAR2
	Suma:	7 777 777,77 zł	

Let us suppose that the noumena have nothing to do with necessity, since knowledge of the Categories is a posteriori. Hume tells us that the transcendental unity of apperception can not take account of the discipline of natural reason, by means of analytic unity. As is proven in the ontological manuals, it is obvious that the transcendental unity of apperception proves the validity of the Antinomies; what we have alone been able to show is that, our understanding depends on the Categories. It remains a mystery why the Ideal stands in need of reason. It must not be supposed that our faculties have lying before them, in the case of the Ideal, the Antinomies; so, the transcendental aesthetic is just as necessary as our experience. By means of the Ideal, our sense perceptions are by their very nature contradictory.

2.2. Caegorical Imperative

2.2.1. Deontological Ethics

Let us suppose that the noumena have nothing to do with necessity, since knowledge of the Categories is a posteriori. Hume tells us that the transcendental unity of apperception can not take account of the discipline of natural reason, by means of analytic unity. As is proven in the ontological manuals, it is obvious that the transcendental unity of apperception proves the validity of the Antinomies; what we have alone been able to show is that, our understanding depends on the Categories. It remains a mystery why the Ideal stands in need of reason. It must not be supposed that our faculties have lying before them, in the case of the Ideal, the Antinomies; so, the transcendental aesthetic is just as necessary as our experience. By means of the Ideal, our sense perceptions are by their very nature contradictory.

2.2.2. Consequentialism – the Ideal of practical reason

As is shown in the writings of Aristotle, the things in themselves (and it remains a mystery why this is the case) are a representation of time. Our concepts have lying before them

the paralogsms of natural reason, but our a posteriori concepts have lying before them the practical employment of our experience. Because of our necessary ignorance of the conditions, the paralogsms would thereby be made to contradict, indeed, space; for these reasons, the Transcendental Deduction has lying before it our sense perceptions. (Our a posteriori knowledge can never furnish a true and demonstrated science, because, like time, it depends on analytic principles.) So, it must not be supposed that our experience depends on, so, our sense perceptions, by means of analysis. Space constitutes the whole content for our sense perceptions, and time occupies part of the sphere of the Ideal concerning the existence of the objects in space and time in general.

2.3. Gödel's ontological proof

In all theoretical sciences, the paralogsms of human reason would be falsified, as is proven in the ontological manuals. The architectonic of human reason is what first gives rise to the Categories. As any dedicated reader can clearly see, the paralogsms should only be used as a canon for our experience. What we have alone been able to show is that, that is to say, our sense perceptions constitute a body of demonstrated doctrine, and some of this body must be known a posteriori. Human reason occupies part of the sphere of our experience concerning the existence of the phenomena in general.

Lorem ipsum dolor sit amet, consectetur adipiscing elit [7], [8], [9], [10].

Założenie 1. $[\phi] \Rightarrow [P(\phi); \neg P(\phi)]$

Aksjomat 1 (Dualność). $\neg P(\phi) \Leftrightarrow P(\neg\phi)$, równoważnie $P(\phi) \Leftrightarrow \neg P(\neg\phi)$

Aksjomat 2 (Całkowitość). $(P(\phi) \wedge \forall x: \phi(x) \Rightarrow \psi(x)) \Rightarrow P(\psi)$

Aksjomat 3 (Absolutność). $P(\phi) \Rightarrow \Box P(\phi)$

Definicja 1. $G(x) \Leftrightarrow \forall \phi: (P(\phi) \Rightarrow \phi(x))$

Definicja 2. $\phi \text{ ess } x \Leftrightarrow \phi(x) \wedge \forall \psi (\psi(x) \Rightarrow \Box \forall y (\phi(y) \Rightarrow \psi(y)))$

Aksjomat 4. $P(G)$

Lemat 1. $P(\phi) \Rightarrow \Diamond \exists x: \phi(x)$

Dowód. Dowód pomijamy, bo jest trywialny :)

□

Lemat 2. $\Diamond \exists x: G(x)$

Dowód. Natychmiastowy wniosek z aksjomatu 4 i lematu 1.

□

Lemat 3. $G(x) \Rightarrow G \text{ ess } x$

Dowód. Poprzez podstawienie do definicji 2.

□

Definicja 3. $E(x) \Leftrightarrow \forall \phi (\phi \text{ ess } x \Rightarrow \Box \exists x: \phi(x))$

Aksjomat 5. $P(E)$

Twierdzenie 1. $\Box \exists x: G(x)$

Dowód. Na podstawie definicji 1, lematu 3 i aksjomatu 5.

□

3. Code listings

Suspendisse vitae elit. Aliquam arcu neque, ornare in, ullamcorper quis, commodo eu, libero. Fusce sagittis erat at erat tristique mollis. Maecenas sapien libero, molestie et, lobortis in, sodales eget, dui. Morbi ultrices rutrum lorem. Nam elementum ullamcorper leo. Morbi dui. Aliquam sagittis. Nunc placerat. Pellentesque tristique sodales est. Maecenas imperdiet lacinia velit. Cras non urna. Morbi eros pede, suscipit ac, varius vel, egestas non, eros. Praesent malesuada, diam id pretium elementum, eros sem dictum tortor, vel consectetur odio sem sed wisi.

Listing 1. *Hello world* w HTML

```
1 <html>
2   <head>
3     <title>Hello world!</title>
4   </head>
5   <body>
6     Hello world!
7   </body>
8 </html>
```

Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla et, consectetur eu, nonummy id, sapien. Nullam at lectus. In sagittis ultrices mauris. Curabitur malesuada erat sit amet massa. Fusce blandit. Aliquam erat volutpat. Aliquam euismod. Aenean vel lectus. Nunc imperdiet justo nec dolor.

Listing 2. Generowanie sekwencji Collatza w języku C++

```
147 class Collatz {
148   private:
149     unsigned current_val_;
150     void update_val() {
151         if( current_val_ % 2 == 0 )
152             current_val_ /= 2;
153         else
154             current_val_ = current_val_ * 3 + 1;
155     }
156
157   public:
158     explicit Collatz(unsigned initial_value) :
159         current_val_(initial_value) {}
160     void print_sequence() {
161         unsigned i = 1;
162         while( current_val_ > 1 ) {
```

```
163         std::cout
164             << "val_" << i << "_=" << current_val_
165             << std::endl;
166         update_val(); ++i;
167     }
168 }
169 };
170
171 int main() {
172     // prints Collatz sequence, starting from 194375
173     Collatz seq(194375);
174     seq.print_sequence();
175     return 0;
176 }
```

Etiam euismod. Fusce facilisis lacinia dui. Suspendisse potenti. In mi erat, cursus id, nonummy sed, ullamcorper eget, sapien. Praesent pretium, magna in eleifend egestas, pede pede pretium lorem, quis consectetur tortor sapien facilisis magna. Mauris quis magna varius nulla scelerisque imperdiet. Aliquam non quam. Aliquam porttitor quam a lacus. Praesent vel arcu ut tortor cursus volutpat. In vitae pede quis diam bibendum placerat. Fusce elementum convallis neque. Sed dolor orci, scelerisque ac, dapibus nec, ultricies ut, mi. Duis nec dui quis leo sagittis commodo.

4. Summatio

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Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetur.

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Bibliografia

- [1] M. Goossens, F. Mittelbach i A. Samarin, *The LaTeX Companion*. Reading, Massachusetts: Addison-Wesley, 1993.
- [2] K. Szczypiorski, A. Janicki i S. Wendzel, „The Good, The Bad And The Ugly: Evaluation of Wi-Fi Steganography”, *Journal of Communications*, t. 10, nr. 10, s. 747–752, 2015.
- [3] B. Bencsáth, G. Pék, L. Buttyán i F. M., „Duqu: A Stuxnet-like malware found in the wild”, Laboratory of Cryptography i System Security, Hungary, spraw. tech., 2011.
- [4] *FIPS 180-4: Secure Hash Standard (SHS)*, 2015.
- [5] P. Woźniak, „Programowanie kwadratowe w usuwaniu efektu rozmycia ruchu w fotografii cyfrowej”, prac. mag., Wydział Elektroniki i Technik Informacyjnych, Politechnika Warszawska, 2018.
- [6] A. M. Brodzki, *Implementation of own steganography protocol DCP-19, loosely based on HICCUPS*, Dostęp zdalny (14.03.2019): <https://github.com/ArturB/DCP-19>, 2019.
- [7] C. Benzmuller i B. W. Paleo, „Automating Gödel’s Ontological Proof of God’s Existence with Higher-order Automated Theorem Provers”, w *European Conference on Artificial Intelligence*, IOS Press, 2014.
- [8] K. Gödel, „Texts relating to the ontological proof”, w *Unpublished Essays and Lectures*, Oxford University Press, 1995, s. 429–437.
- [9] H. Wang, „A Logical Journey: From Gödel to Philosophy.”, w A Bradford Book, 1997, s. 316.
- [10] R. C. Koons, „Sobel on Gödel’s Ontological Proof”, Dostęp zdalny (25.04.2019): <http://www.robkoons.net/media/69b0dd04a9d2fc6dffff80b4ffffd524.pdf>, 2005.

Wykaz symboli i skrótów

EiTI – Wydział Elektroniki i Technik Informacyjnych

PW – Politechnika Warszawska

WEIRD – ang. *Western, Educated, Industrialized, Rich and Democratic*

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Załącznik 1. Nazwa załącznika 1

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Politechnika Warszawska

Rysunek 1.1. Obrazek w załączniku.

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Załącznik 2. Nazwa załącznika 2

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Tabela 2.1. Tabela w załączniku.

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