Университет ИТМО, факультет программной инженерии и компьютерной техники
Двухнедельная отчётная работа по «Информатике»: аннотация к статье

Дата прошедшей лекции	Номер прошедшей лекции	Название статьи/главы книги/видеолекции	Дата публикации (не старше 2021 года)	Размер статьи (от 400 слов)	Дата сдачи
11.09.2024	1	Information Theory, Living Systems, Communication Engineering	18.05.2024	~5050	25.09.2024
	2				
	3				
	4				
	5				
	6				
	7				

Выполнил(а) Юксель Хамза, № группы *P3132*, оценка _____
Фамилия И.О. студента — не заполнять

Прямая полная ссылка на источник или сокращённая ссылка (bit.ly, tr.im и т.п.)
https://doi.org/10.3390/e26050430

Теги, ключевые слова или словосочетания (минимум три слова)
Information Theory, Biology, Genetic Information, Data Transmission, Error Control, Compression, Living Systems.

Перечень фактов, упомянутых в статье (минимум четыре пункта)
1. Recent research has shown that the pulse pattern of neurons is a hybrid analog-digital, and thus the amount of information transmitted is greater than previously thought, and these findings are similar to the “piggybacking” technique used in data transmission systems.
2. In nature, lossy compression has been applied to improve transmission. The relationship between excitation and pulse frequency is non-linear and is usually approximated by a logarithmic function. According to the Weber-Fechner law, the relationship between excitation (S) and pulse frequency (f) is $f \approx a.\log(S) + b$. The price of more efficient transmission is lower resolution; a larger intensity change is required to distinguish between two different stimuli.
3. Information is stored and transmitted as a sequence of nucleotides (A, G, T(U) and C). DNA transmits information both in space through host movement and in time through inheritance. DNA records are permanent; for example, the DNA record of a Siberian mammoth that lived about 1,500,000 years ago has been successfully decoded.
4. During DNA replication, the enzyme DNA polymerase generates complementary nucleotides for the separated DNA strands. Two types of errors can occur during this process: the production of incorrect nucleotides (substitution errors) and strand slippage. Both errors have analogs in communication data transmission, with the latter known as “cycle-slip.”
5. Information on proteins is conserved according to the principle of one-way function, thus mapping a codon to an amino acid is easy, but reverse mapping is not.

Позитивные следствия и/или достоинства описанной в статье технологии (минимум три пункта)
1. Enhanced understanding of biological data transfer
2. Inspiration for communication systems
3. Potential of applying natural engineering solutions to human technologies
4. Interdisciplinary connections

Негативные следствия и/или недостатки описанной в статье технологии (минимум три пункта)
1. Error potential in data framing transmission
2. Destructive compression and loss of information
3. Low resolution in data transmission

Ваши замечания, пожелания преподавателю *или* анекдот о программистах[1]

[1] Наличие этой графы не влияет на оценку