The space Needle. Symbol of Seattle, Washington State

English B2
IM259, *Lingua Inglese Pari a Livello B2*

Lesson 11
The scientific paper

1. Let's review the scholarly texts a student of English B2 must be familiar with:

Review of scholarly texts

- Work email
- Résumé
- Curriculum Vitae
- **Paper** (congress, symposium, course work).
- Thesis / Dissertation

2. Let's talk about the scholarly paper usually called just "paper".

   a. Definitions

      - In academic publishing, a paper is an academic work that is usually published in an academic journal. It contains original

research results or reviews existing results. Such a paper, also called an article, will only be considered valid if it undergoes a process of peer review by one or more *referees* (who are academics in the same field) who check that the content of the paper is suitable for publication in the journal.

- A paper is a piece of writing on a particular subject that is usually longer than an essay, especially one that a student does as a requirement of course work.

Based on: Britannica.com, Wikipedia, and HarperCollins. Writing (Collins Webster's Easy Learning) . HarperCollins Publishers. 2011. Kindle Edition.

2.b.

Key point to remember:

Before you even start to plan your paper or academic article make sure you have a copy of the **journal rules** on how to structure it.

2.c.

Let's review some examples taken from ICTP scientific publications.

By the way, do you even know what ICTP stands for? In case you don't:

> The **Abdus Salam International Centre for Theoretical Physics** (**ICTP**) is an international research institute for physical and mathematical sciences that operates under a tripartite agreement between the Italian Government, United Nations Educational, Scientific and Cultural Organization (UNESCO), and International Atomic Energy Agency (IAEA). It is located near the Miramare Park, about 10 kilometres from the city of Trieste, Italy. The centre was founded in 1964 by Pakistani Nobel Laureate Abdus Salam.
>
> ICTP is part of the Trieste System, a network of national and international scientific institutes in Trieste, promoted by the Italian physicist Paolo Budinich.

Why do we mention ICTP here?

Well, **ICTP**, together with **SISSA** (Scuola Internazionale Superiore di Studi Avanzati) and **Università di Trieste** produce most scholarly papers in our region and we can explore this scientific universe in search of inspiration!

In the following we'll analyse one of ICTP's scientific papers trying to individuate its main features.

Please, read the following article. Kindly note that you may or may not be familiar with the theme presented. It is not important at the moment. We are not reading for content this time. We are reading in order to examine the structure of this piece of scientific work.

Note: In order to save space reasons we are going to omit the body of the article. The full version of it can be found at:

http://wireless.ictp.it/Papers/parking.pdf

3.

Structure of a scientific paper

In general terms, we can state that a scholarly paper is structured in the following way:

i. Name of the paper: Contains in a few words the gist of the article. i.e. What the article is about

ii. Name of the authors and academic adscription. The order in which the names appear in an article reveals different criteria. Usually, the ordering has been discussed and approved by the research team.

iii. Abstract. It's a very important part in a paper. Most online scientific journals allow access to the abstracts only. The way you present your work in a summarised, concise way is going to attract (**or not**¡) the reader towards the full version of the article. In other words, the abstract in a paper is your presentation towards the scientific community. It'd better be good!

iv. Introduction. In general, you present here the rationale behind the work you are going to describe. Sometimes you mention briefly precedent works along the same line.

v. Development. It is a detailed description about the steps you followed in order to solve a specific problem. Usually you explain the "tools" you employed to solve it, the main difficulties you encountered, and your way to circumvent the complications. *Tools*, in this case, refers loosely to methods, and materials employed in the development of your research. Also in this part, sometimes under the heading "analysis" you discuss the results obtained at the end of the scientific venture.

vi. Conclusions. At this point you (and your team) present the interpretations that follow your experience and tell the scientific community in what way

your work has contributed to best solve the specific problem that interested you at the beginning of the experience. You may also signal the possible gaps in your work and the potential follow-ups of the experience.

vii. References. In this part you specify the list of all the scientific works you have reviewed prior to the elaboration of your paper, which support your present work. This is not a mere list of authors and articles, of course. Along the elaboration of the article you have to signal which part of your experience was based on which authors and if possible, how your work corroborates, or refutes previous findings.

viii. Acknowledgments. It is not necessary in every case. But if you have received funding for the developing of your work, you have to mention it. In any case, all journals have specific rules as to how to proceed in this case. You have to abide by the journal rules at all times.

Recommended reading about writing scholarly papers:

https://www.springernature.com/gp/authors/campaigns/writing-a-manuscript

3.a.
Scientific paper example

(Remember that only the abstract is reproduced here. Explore full version at: http://wireless.ictp.it/Papers/parking.pdf)

IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS 1

GWO Model for Optimal Localizationof IoT-Enabled Sensor Nodes inSmart Parking Systems

Sheetal N. Ghorpade, Marco Zennaro, *Senior Member, IEEE*, and Bharat S. Chaudhari, *Senior Member, IEEE*

***Abstract*—Due to rapid growth in urban population and advances in the automotive industry, the number of vehicles is increasing exponentially, posing the parking challenges. Automated parking systems provide efficient and optimal parking solution so that the drivers can have hassle free and quick parking. One of the demanding requirements is the design of smart parking systems, not only for comfort but also of economic interest. With the advancements in the Internet of Things (IoT), wireless sensors-based parking systems are the promising solutions for the deployment. Optimal positioning of IoT enabled wireless sensor nodes in the parking area is a crucial factor for the efficient parking model with the lower cost. In this paper, we propose a novel multi-objective grey wolf optimization technique for node localization with an objective to minimize a localization error. Two objective functions are considered for distance and geometric topology**

constraints. The proposed algorithm is compared with other node localization algorithms. Our algorithm outperforms the existing algorithms. The result shows that localization error is reduced up to 17% in comparison with the other algorithms. The proposed algorithm is computationally efficient due to the choice of fast converging parameters.

***Index Terms*—Smart parking, Internet of Things, node localization, multi-objective optimization, grey wolf optimization, Pareto optimal set.**

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4.
Final consideration

Why is the structure of a scientific paper important to us? A good scholarly paper has many features in common with a very important text in academic life: **the thesis or dissertation**. In most high educational institutions, writing a thesis demonstrating your ability to solve problems in your professional area is a necessary requirement to obtain an academic degree.

Before describing the dissertation/thesis structure in next lesson, let's do some exercise using the paper under scrutiny.

EXERCISE

In the abstract above, I have highlighted some clue-phrases. Based on that, try to answer the following questions.

1. What is the problem the authors are trying to tackle in real life?

2. Why is important to solve it?

3. Are there solutions until now?

4. What are the "tools" used by the research team to provide the best solution?

5. Do this team succeed in providing a good solution to the initial question? How?