EAP506 Yiheng Cao Nov 23

Language analysis

Compared with common writing, academic writing has stricter rules. It means the language in academic writing is more formal. Authors should carefully use the language in order to express their ideas better. In this paper, I will analyze the language of article in Electrical Engineering. I chose Roland Hildebrand, Michel Gevers and Gabriel Elías Solari’s article named “Closed-Loop Optimal Experiment Design: Solution via Moment Extension” from IEEE Transactions on Automatic Control [1]. I will discuss tense and citation in each part, language features and special terms.

I used Swales and Feak’s table to analyze the frequencies of selected features in each part. [2] The results are interesting. Firstly, in the introduction part, most sentences are present tense such as “A more compact way to parametrize the set of all possible extensions of a given ﬁnite moment sequence is via the representation of the extensions as Carathéodory functions”.[1] I think this is because the authors are describing the phenomenon or the purpose of the article. Citations appears frequently in the introduction part. When the authors refer to previous research, they use the past tense to tell the reader what have been done before. For example, “In [3] a ﬁnite dimensional approximation approach was used.”[1] Secondly, in the method part, most sentences are also present tense, which is different from other discipline. For example, “The system dynamics is given by the relation y = G0(q)u + H0(q)e.”[1]. I think the reason is that the authors in our discipline usually prove their method by using the theoretical knowledge such as mathematics. Few citations are found in this part because they should show what they have done for this topic. Same with method part: most of the result part are also present tense. For instance, “We see that the empirical covariance matrix has a 30% smaller determinant for the experiments with optimal input-controller pair.”[1] I think the authors prefer to give the simulation results in this way. What’s more, it is the result rather than process that matters in engineering. Lastly, for the discussion part, present tense is high. For instance，“One of the key advantages of the solution method developed in the present paper is that…”[1] It is common to write discussion or conclusion in this way. No citation is found in this part since the content is what the authors have found. .

The language of this article is formal. According to Swales and Feak[2], the formal language should avoid negative forms, contractions and pronoun you. The authors used none of them in their article, which make the article more academic. As for negatives, the author stated “because it does not yield an explicit power spectrum”, [1] which may be considered informal. However, it is acceptable in Electrical Engineering. The authors also use vague expressions like “In particular, all classical designs (D-optimal, A-optimal, L-optimal etc.)”[1] Because it is not necessary to give all of designs since the readers have fundamental knowledge. There are no direct questions in the article. Even there is no indirect questions. It is easy to understand because the article aims to give the design via moment extension. The authors only need to show how to do this. The adverbs of this article are placed in the mid-position such as “The conﬁguration of the identiﬁcation experiment is schematically depicted in Fig. 1.”[1], which shows the language is formal. With the same reason the authors do not use split infinitives. I often see we in the article. For example, “We present two ways of parametrizing all inﬁnite extensions of a ﬁnite moment sequence.”[1] Using we makes it easy to show what the authors have done and express their ideas. In addition, the authors also use passive voice to stress on the thing rather than people such as “The remainder of the paper is organized as follows.”[1] Long sentences are common in the article. For example, “The parameter vector θ0 is to be identiﬁed by an experiment, which consists in collecting a set of input-output data u, y on the system, which is possibly under closed-loop control according to the relation u = −K(q)y + r (2) where r is a quasi-stationary process of dimension m, and K(q) is a m×p matrix-valued feedback controller.” However, these sentences are not wordy because all the information is useful. The interesting thing is that the word “may” appears frequently in the article such as “the central extension may produce an optimal spectrum that remains ﬁnite”. [1] The authors use this word because they want to show the possibility.

Like other disciplines, Electrical Engineering uses many words with special meaning, which means some of these words can only be understood by people in this field. For example, moment, signal and sequence have the different meaning with the common usage. Additionally, the authors defined some special terms and explained them for readers. For instance, “The function F(z) in Proposition 2 is called the central Carathéodory function” [1]. This is useful because they can use the term instead of giving the whole function in the following part.

Furthermore, formulas and proofs are important and popular in this article. I think it is typical because the readers care about credibility. So it also requires the readers should have the related knowledge in order to understand the article.

In conclusion, the language of “Closed-Loop Optimal Experiment Design: Solution via Moment Extension” is formal and typical in our discipline. It avoids the contractions, indirect questions and pronoun “you”. In addition, it uses “we” as well as passive voice to express different meaning. As long as the readers have the related knowledge, they can easily understand the article.

Reference

[1] R. Hildebrand, M. Gevers, G.E. Solari. “Closed-Loop Optimal Experiment Design: Solution via Moment Extension” *IEEE Transactions on Automatic Control*, vol. 60, pp. 1731 - 1744, Nov. 2015

[2] J.M. Snales, C. B. Feak. “Academic Writing for Graduate Student: Essential Skills and Tasks” 3rd ed, Ed.University of Michigan Press, 2012