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Literature Review Paragraph Analysis

**Paragraph 1:**

 Draft is the vertical measurement from the waterline to the bottom of an object, such as a ship. The method most commonly used by shipbuilders to measure draft relies on dangerous visual observation of painted draft marks. Since draft data is invaluable to ship safety and in measuring cargo mass, new methods of automatic draft measurement must be explored. Even though pressure sensors are currently used to measure draft on submarines [1], the permanently installed system is costly and becomes unreliable in the presence of moving flow [2]. An alternative to this method is to integrate optical fibers into existing pipework. The amount of light that is “leaked” from the fibers depends upon the medium in which the fibers are suspended, with more loss occurring in air rather than water [3]. The signal received at the end of the fiber varies with how much is immersed in water, which is the basis for measuring draft.

**What is the main topic of this paragraph?**

The main topic of this paragraph is to introduce the reader to the concept of draft measurement and to suggest optical fiber technology as an alternative to relying on visual observation.

**How does this paragraph function in the argument/arrangement of the paper?**

This paragraph, while part of a literature review, is the basis of the research paper’s introduction. This paragraph serves to introduce the reader to the concept of draft measurement and optical fiber technology without delving too much into heavy detail. As part of the literature review, it outlines what is currently known about the subject, while asserting the importance of further research.

**How is this paragraph connected to the one above?**

This is the first paragraph of the draft. The literature review can be minutely tweaked to produce a viable introductory paragraph, so this paragraph can be seen as the introduction.

**How is this paragraph connected to the one below?**

This paragraph outlines what is already known about draft measurement and optical fiber technology. This is important since it sets up the following paragraph, which acknowledges what is unknown regarding the subject.

**Paragraph 2:**

 While it is known that the received signal can be calibrated to read draft, the accuracy of the technology has not been precisely determined. The effects of weather and other water clarity factors may impact the calibrated draft reading. However, only a negligible difference between salt and fresh water has been observed, such that the calibrated reading can be treated as a single set [3]. Also, the type of light source could potentially have drastic effects on draft reading. Previous researchers have opted for LED as the light source due to low cost and configurability, yet the effects of specific LED colors have not been adequately investigated [4]. Experimenting with the accuracy of optical fiber draft measurement could prove to be a vital launching point for the technology. Furthermore, experiments on time-dependent mean draft are necessary in order to prune the currently required three minute average to a more pragmatic number [5]. By conducting specific research with a focus on aircraft carriers, it is possible that U.S. Navy aircraft carriers may finally have access to automated pre-alarm and disaster prevention while at sea.

**What is the main topic of this paragraph?**

The main topic of this paragraph is to present issues of integrating optical fibers into draft measurement devices and to explain why researching these issues is important.

**How does this paragraph function in the argument/arrangement of the paper?**

This is the second paragraph of the literature review/introduction. This paragraph outlines some of the major “unknowns” of optical fiber technology in a maritime environment. Furthermore, the end of the paragraph notes the importance of researching these topics, which amounts to allowing the U.S. Navy to have access to automated pre-alarm and disaster prevention while at sea.

**How is this paragraph connected to the one above?**

This paragraph builds upon the earlier paragraph by connecting what is currently known about optical fibers to what else needs to be known. Without this paragraph to follow up the introductory paragraph, there would be no apparent reason to research the topic.

**How is this paragraph connected to the one below?**

Since this is all that is currently available, it is hard to say how exactly this paragraph will connect to the next paragraph in the main paper. However, introductions serve to give the readers a basic overview of the research paper. Therefore, this paragraph is connected to the next paragraphs by outlining and condensing the main topics covered in the rest of the paper. Also, this paragraph describes the importance of the research.

**Reflection**

I learned from this exercise that I do not adequately understand the direction in which I will take my research paper. While this literature review may have some semblance to an introductory section, it does not sufficiently fill the role. I must find out more about my actual research and how I will handle the experimentation and design processes before I adequately understand how to write the introduction. In the final introduction, I will most likely change both paragraphs to only briefly describe the basics of draft measurement and optical fibers. Instead, I will include more about my methodology and reasoning for conducting the research.

[1] D. A. Rothrock and M. Wensnahan, "The accuracy of sea ice drafts measured from U.S. Navy submarines," *Journal of Atmospheric and Oceanic Technology,* vol. 24, pp. 1936-49, 2007.

[2] Z. Huayao, H. Yunqian, and Y. Yinzhong, "New level sensor system for ship stability analysis and monitor," *IEEE Transactions on Instrumentation and Measurement,* vol. 48, pp. 1014-17, 1999.

[3] R. Ivce, I. Jurdana, and R. Mohovic, "Determining weight of Cargo onboard ship by means of optical fibre technology draft reading technology," *Promet - Traffic - Traffico,* vol. 23, pp. 421-429, 2011.

[4] A. F. Omar and M. Z. MatJafri, "Development of optical fiber sensor for water quality measurement," in *Current Issues of Physics in Malaysia. National Physics Conference 2007, PERFIK 2007, 26-28 Dec. 2007*, USA, 2007, pp. 398-402.

[5] L. Mengde, G. Zhigang, Z. Jie, C. Xiao, Y. Li, C. Shibo*, et al.*, "Development of Laser Water Level Measuring System Without Cooperative Target," in *2012 Symposium on Photonics and Optoelectronics (SOPO 2012), 21-23 May 2012*, Piscataway, NJ, USA, 2012, pp. 1-3.