JI: Intro to the Lit Review

Adapted from Sarah Burcon

Lit Review: Why do you need one?

1. To make sure you are not simply "re-inventing the wheel," or not simply replicating a research project that others have already completed

2. Giving a suitable account about the relevant previous work enables you to demonstrate how your current work is situated within, builds upon, or departs from earlier publications

3. The narrative you have successfully told shows others that you are a member of your chosen field: credibility!

Taken from Swales and Feak, *Telling a Research Story*, p. 2

Why are we learning about the lit review in VE496/490?

We started with the *beginning* of your potential projects: problem/needs/solution analysis and the abstract

Now we are going over the *"meat"* of many genre you may find yourself writing: methods, lit review, technical definition (next!)

Then, you will learn how to pitch your project orally

Finally, presenting some *final ideas* in the proposal and a slide deck presentation

Lit Review: Points to Consider

The LR is not usually argumentative overall; its mode is largely informative,

BUT

It does argue for a particular perspective on the material, and it is rhetorical
It must convince your readers...**of what**?

This and subsequent slides on Lit Review taken from Elizabeth Hildinger, Lecture, UM

Rhetorical goals of the Lit Review

- To convince your reader that you know how the field has developed; i.e., that you recognize and understand

  - the influences & major directions
  - the key questions & controversies
  - **the current state of knowledge**

- To convince your reader that you can exercise selectivity & critical judgment

Organizing Strategies

- Will it be strictly chronological?

- Will it be organized by key questions or problems?

- Will it be organized by method or approach?

- Will it combine one or more of these strategies?

Lit Review Example Sentences

In recent years, many researchers have shown interest in the field of coastal erosion and the resulting beach profiles. They have carried out numerous laboratory experiments and field observations to illuminate this field. Their findings and suggestions are reviewed here.

Hom-ma and Horikawa (1995) studied wave forces acting on a seawall located inside the surf zone. On the basis of experimental results conducted to measure the wave force against a vertical wall, the authors proposed an empirical formula for wave pressure distribution on a seawall. The computed results obtained by using the formula compared well with the field data on wave pressure on a vertical wall.

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Sample Introduction

 In the average internal combustion engine driven automobile, only 25% of the energy generated from combustion can be used by the vehicle for mobility and accessories. The rest of the combustion energy is wasted, including 40% that is lost to exhaust gas [1]. Various methods have been developed to try to recover some of this lost energy, including turbogenerators, Rankine Cycle recovery systems, thermochemical recuperation, and thermoelectric generators (TEGs) [2]. Additionally, some hybrid cars including the Toyota Prius use regenerative braking to recover some of the kinetic energy lost when stopping the vehicle [3].

Thermoelectric generators are attractive potential waste heat recovery systems because they are relatively inexpensive, have no moving parts (and thus produce no noise and no vibrations), and are highly reliable [4]. Previous studies have attempted to develop TEG systems for waste energy recovery in light trucks [5][6][7], but these studies have not considered lighter cars with hybrid engines such as the Prius. In addition, previous researchers have not specifically taken into account the driving habits of university students.

In this study, we investigated the possibility of developing a waste heat recovery system mounted on the exhaust system of the Toyota Prius as driven by college students using TEGs coupled with heat sinks mounted on the exhaust system of the vehicle. Specifically our goals for this study were as follows:

1 Determine the average driving conditions for college students. 2 Find the TEGheat sink configuration for optimum power output for our smallscale laboratory setup. 3 Develop a mathematical model to extrapolate experimental data to realworld conditions based on our driving conditions survey. 4 Assess the feasibility of implementing a TEGbased energy recovery system in the Toyota Prius.

Taken from: https://elicorpora.info/view?pid=MEC.G0.04.1

Sample Introduction: Comments

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Problem

Background

Lit Review/Gap

Hypothesis

College of Engineering

References in your work

Cite material taken from books, journal papers, the Internet, and other works.

Many on-line guides can help you with citations.

Below is a quick guide for in-text citations.

Within a text, citations are indicated by numbered brackets in their order of appearance. The in-text citation typically appears at the end of the sentence, though it is sometimes moved after its relevant information for clarity.
  • Example: The reference Young's Modulus of polystyrene, 0.05 ∓ 0.02 GPa [1], does not match the measured value of our sample within uncertainty.

When two sources are being cited, the numbers are separated by a comma [2,3]. When more than two are cited, numbers are separated by a dash [4-6]. Sometimes, an author or paper is explicitly referred to.
• Example: Li and colleagues [7] argue that there is no universal technique...

At the end of the paper, list the references in the order they were cited (numerical order).

When in doubt: **cite** to avoid plagiarism.

Plagiarism: taking someone else's work or ideas and passing them off as one's own
https://lsa.umich.edu/english/undergraduate/advising/note- on-plagiarism.html

Examples of Lit Reviews in Journal Article

Enhancing the convolution-based knowledge graph embeddings by increasing dimension-wise interactions

Knowledge graphs (KGs) are knowledge bases represented in graph structure, composed of entities and relations. Triples like (head entity, relation, tail entity) are usually used to represent facts in KG, e.g., (Shanghai, cityOf, China). Multiple KGs have been constructed, for instance, Freebase [1], DBpedia [2], and Wikidata [3]. KGs can be helpful to incorporate human knowledge into different downstream tasks like semantic parsing [4], question answering [5], and information extraction [6]. However, as symbolic representation, triples are difficult to operate [7]. Additionally, large-scale KGs are usually built through auto or semi-auto methods, which leads to the problem of incompleteness.

A new approach to COVID-19 data mining

The prediction research of TRI can be regarded as a branch of traffic prediction, and there are two main approaches to solve this problem [11]. The first approach is to solve short-term traffic prediction problems based on the research of traditional mathematical statistics [12], such as time series models, parametric regression models [13], etc. The second approach is to train models based on deep learning. This kind of model method does not pursue strict mathematical derivation and physical definition [14], but attaches great importance to the fitting effect of real traffic flow. There are three main approaches of deep learning in the field of traffic prediction. The first approach is deep autoencoder neural network, which is mainly used for short-term traffic congestion prediction [15]. The second approach is the Recurrent Neural Network (RNN) [16], which is mainly used to solve the prediction problem of time series data. The third approach is the Convolutional Neural Network (CNN) [17], which are mainly used to capture the spatial correlation features of transportation networks. At present, the research of deep learning focuses on the fusion of different neural network structures, absorbing the advantages of different architectures, so that the model has better accuracy and stability [18]. The traffic condition of the target area is affected by the surrounding area or the further area, which makes the urban traffic area have a certain spatial dependence [19]. To solve the problem of spatial dependence of traffic data, researchers use graph topology [20] to represent traffic data, and set different adjacency matrices to represent graph topology according to different data characteristics.

Logical big data integration and near real-time data analytics

Many systems have been developed to enable the execution of distributed queries over heterogeneous data sources (e.g., CloudMdsQL [7], Presto [8], Apache Drill [9]). However, they are complex and need lots of work to configure and create queries. Frequently, the users must know the details regarding the data distribution and the internal organization of the data in their sources. Moreover, they were not designed for data analytics and decision-making. There is a lot of work on solving specific problems related to data integration, but creating solutions that go all the way in the data-to-insights pipeline, i.e., from raw data to the desired outcome, remains an open issue [10].

EasyBDI [11] is an open-source system for logical data integration that hides the complexity of data distribution and the particularities of organization of the data in the local sources from the domain experts.