Literature Review Activities

Sciences, Technology, Engineering, Mathematics & Geospatial Sciences

Activity 1: Writer's voice

1. Read the extracts from 2016 theses.

2. In each, identify the writer's voice, their critical approach.

3. Notice the sentences and linking words that direct the reader towards the research topic.

4. After each activity an answer slide will offer comments.

Image source: Microsoft Office Clipart

a. Logistics, Mech. & Computer Engineering

Identify the sentences that indicate the researcher's voice of authority.

Upstream complexity is caused by some important factors such as supply chain structure, number of nodes and relationships, as well as the different interaction levels between major suppliers. Most publications on upstream manufacturing complexities are related to structural and dynamical issues with specific focus on dyadic interactions between buyers and suppliers (Giunipero and Eltantawy, 2004b). The method of analysis, however, needs to go beyond the traditional buyer-supplier dyad to consider all potential factors. It is important to establish how individual components of the system relate to each other, and how these relationships can determine overall system behaviour and performance (Garbie, 2012). This is essential when assessing the ways in which the upstream side of a supply chain can best cope with an emergent situation.

a. Logistics, Mechanical Engineering

Answer

Upstream complexity is caused by some important factors such as supply chain structure, number of nodes and relationships, as well as the different interaction levels between major suppliers. Most publications on upstream manufacturing complexities are related to structural and dynamical issues with specific focus on dyadic interactions between buyers and suppliers (Giunipero and Eltantawy, 2004b). The method of analysis, however, needs to go beyond the traditional buyer-supplier dyad to consider all potential factors. It is important to establish how individual components of the system relate to each other, and how these relationships can determine overall system behaviour and performance (Garbie, 2012). This is essential when assessing the ways in which the upstream side of a supply chain can best cope with an emergent situation.

Adapted from Hakami, A. Y. 2016

b. Automotive Engineering, Robotics

Identify the sentences that indicate the researcher's voice of authority.

> Despite their desirable properties, the synthesis of clothoids is challenging. There is no closed form expression for clothoids as they are evaluated using Fresnal Integrals. Several methods have been proposed to approximate clothoids such as Bézier curve and B-spline fitting (Wang et al., 2001), arcs (Meek and Walton, 2004), 11th order Béziers (Montes et al., 2008) and 26th order polynomials (McCrae and Singh, 2009). These methods are suitable for CAD applications. The high order polynomials used for approximation methods cannot be evaluated in a suitable manner for real-time robotic applications. To address the real-time use of clothoids in robotics, a basic curve was stored in a look up table and geometric transformations were applied to synthesize the required curves (Brezak and Petrovic, 2014). The length and orientation of the generated Clothoids are limited to minimize the approximation error. This method is, by no means suitable, for real-time dynamic applications and re-planning scenarios.

Source: Elbanhawi, 2016.

b. Automotive Engineering, Robotics

Answer

Despite their desirable properties, the synthesis of clothoids is challenging. There is no closed form expression for clothoids as they are evaluated using Fresnal Integrals. Several methods have been proposed to approximate clothoids such as Bézier curve and B-spline fitting (Wang et al., 2001), arcs (Meek and Walton, 2004), 11th order Béziers (Montes et al., 2008) and 26th order polynomials (McCrae and Singh, 2009). These methods are suitable for CAD applications. The high order polynomials used for approximation methods cannot be evaluated in a suitable manner for real-time robotic applications. To address the real-time use of clothoids in robotics, a basic curve was stored in a look up table and geometric transformations were applied to synthesize the required curves (Brezak and Petrovic, 2014). The length and orientation of the generated Clothoids are limited to minimize the approximation error. This method is, however, unsuitable for real-time dynamic applications and re-planning scenarios.

Adapted from Elbanhawi,,(2016).

c. Computer and Electronic Engineering

Identify the sentences that indicate the researcher's voice or authority.

> Direct muscular forces are not practically measurable. Experimental studies use the externally recorded joint torque produced during a maximal voluntary contraction as representative of muscle strength. However, antagonistic muscles that oppose the action of the prime mover can significantly contribute to the resultant joint torque measured (Simoneau, Billot et al. 2009). Therefore, their contribution to the external joint torque needs to be considered.

Source: Siddiqi, 2016.

c. Computer and Electronic Engineering

Answer

Direct muscular forces are not practically measurable. Experimental studies use the externally recorded joint torque produced during a maximal voluntary contraction as representative of muscle strength. However, antagonistic muscles that oppose the action of the prime mover can significantly contribute to the resultant joint torque measured (Simoneau, Billot et al. 2009). Therefore, their contribution to the external joint torque needs to be considered.

Source: Siddiqi, 2016, p.19

d. Mathematics & geospatial sciences

Identify the sentences that indicate the researcher's voice or authority.

It is hard to generate truly unbiased samples of networks with fixed degree sequences. Existing random network models that achieve this fall into two categories: the 'fill methods' and methods based on Markov chains. Fill methods *construct* a network, starting with just nodes and adding edges one at a time until reaching the desired in-degree and out-degree distribution [112, 84, 95]. These methods are generally fast. However they either produce a biased sample or only rarely produce a network that is not a multigraph [69, 25].

Carstens, 2016, p.38

d. Mathematics & geospatial sciences

Answer

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Adapted from Carstens, 2016, p.38

Activity 2: Citations

1. Look at the **referencing styles** used in the five extracts above.

2. Can you identify **THREE** and name them? (get familiar with referencing styles at the Library's Referencing Guides http://www1.rmit.edu.au/browse;ID=8rwjnkcmfoeez)

   What reference style will you use in **your thesis**? Why?

3. Look at the **citations** in the extracts. Are they **author-prominent** or **information-prominent**?

4. What **generalisation** can you make about **citation style** in these disciplines? Can you explain why?

5. Look at the next slide and explain why the writers have made the unusual decision to use an **author-prominent citation**.

Answers
Referencing styles
- Harvard   (Jyun 2009) (no comma)
- Endnote   [56, 61]
- APA   (Lyons, 2016) (comma)

Citations

All are information-prominent

Generalisations
These fields tend to use more information-prominent citations because they:
- focus on the 'facts' (generalisable and objective, not individual and subjective = 'positivist')
- Use not ideas-based thinking, but objects-based thinking

Field	Example	Explanation
Textile Tech. Eng.	The first development appeared in the 1960s when Folkman [1] circulated rabbit blood inside a silicone rubber arteriovenous fistula and discovered that if he exposed the tubing to anaesthetic gases on the outside, the rabbits would fall asleep. (Jalvandi, 2016:4)	Seminal/ground-breaking research – first ever (named and honoured)
Applied Sciences (Biotech)	**Figure 1.6:** Activation of cellular and humoral immune responses. The solid arrows indicate immune response activation after a primary infection with influenza virus. The dotted arrows indicate the rapid induction of virus-specific memory cell responses with a secondary influenza virus infection. Figure obtained from **van de Sandt *et al* (2012)**. (Karkashan, 2016: 35)	Figures often have an author-prominent citation (original design by the researcher)
Applied Sciences	According to the investigation conducted by **Battistoni *et al.* [48]**, mercury atoms were found to diffuse through 5 - 6 nm sub-layer of a thin gold film after only 30 minutes exposure to Hg0 at low µg/m3 (low ppbv) range concentrations. Later studies also indicated that the diffusion of mercury molecules can be even deeper into the Au when higher Hg0 vapour concentrations and longer Hg exposure times are used [41, 52]. (Kabir, 2016: 19)	Original research of relevance to Kabir's research for the thesis.
Maths & Geospatial Sci.	According to **El-Rabbany (2006),** GPS-determined ellipsoidal heights are affected by several types of errors such as: a. GPS ephemeris error… (Pinon, 2016:20)	Pinon will attempt to correct these errors

Citations

This example comes from applied sciences. The final citation is a weak form of author prominence. It is another reason why information-prominent citations are more likely in applied scientific fields. Can you explain?

An extensive library of benzo[*b*][1,4] dioxepin-3-one analogues were synthesised and evaluated by researchers at Firmenich, Switzerland.[73]

Plummer, 2016

Answer

Research is conducted under contract to a registered company, so individual researchers are not named. The writer must use a weak author-prominent citation.

Activity 3: Passive voice

In science writing the research object or action is usually the subject of the sentence (to emphasise the factual nature of the work). The researcher 'disappears'.

Scientists evaluate clothoids using Fresnal Integrals. ✗

Clothoids are evaluated using Fresnal integrals. 👍

Convert these sentences so that the object of study becomes the subject (at the front).

1. Brezak and Petrovic (2014) applied geometric transformations in order to synthesize the required curves.

   Geometric transformations were applied in order to synthesize the required curves (Brezak and Petrovic, 2014).

2. Important factors such as supply chain structure, number of nodes and relationships, and the different levels of interaction between major suppliers are some of the causes of upstream complexity .

   Upstream complexity is caused by some important factors such as supply chain structure, number of nodes and relationships, as well as the different levels of interaction between major suppliers.

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Activity 4: Verb tenses/Action words

Identify the **verbs** and **highlight** them.
Why use different **verb tenses**? Why switch between past, present perfect or present in active and passive forms? See next slide for answers.

Despite their desirable properties, the synthesis of clothoids is challenging. There is no closed form expression for clothoids as they are evaluated using Fresnal Integrals. Several methods have been proposed to approximate clothoids such as Bézier curve and B-spline fitting (Wang et al., 2001), arcs (Meek and Walton, 2004), 11th order Béziers (Montes et al., 2008) and 26th order polynomials (McCrae and Singh, 2009). These methods are suitable for CAD applications. The high order polynomials used for approximation methods cannot be evaluated in a suitable manner for real-time robotic applications. To address the real-time use of clothoids in robotics, a basic curve was stored in a look up table and geometric transformations were applied to synthesize the required curves (Brezak and Petrovic, 2014). The length and orientation of the generated Clothoids are limited to minimize the approximation error. This method is, however, unsuitable for real-time dynamic applications and re-planning scenarios.

Verbs are explained here: https://wwwlyndacom.ezproxy.lib.rmit.edu.au/Business-Business-Skills-tutorials/Grammar-Fundamentals/158318-2.html

Activity 3: Verb tenses/Action words

Answer

Despite their desirable properties, the synthesis of clothoids **is** challenging. There **is** no closed form expression for clothoids as they **are evaluated** using Fresnal Integrals. Several methods **have been proposed** to approximate clothoids such as Bézier curve and B-spline fitting (Wang et al., 2001), arcs (Meek and Walton, 2004), 11th order Béziers (Montes et al., 2008) and 26th order polynomials (McCrae and Singh, 2009). These methods **are** suitable for CAD applications. The high order polynomials **used** for approximation methods **cannot be evaluated** in a suitable manner for real-time robotic applications. **To address** the real-time use of clothoids in robotics, a basic curve **was stored** in a look up table and geometric transformations **were applied to synthesize** the required curves (Brezak and Petrovic, 2014). The length and orientation of the generated Clothoids **are limited to minimize** the approximation error. This method **is**, however, unsuitable for real-time dynamic applications and re-planning scenarios.

is (copula): common when we emphasise the subject of study.

Present passive: current state of play emphasising objects/functions

Present perfect passive: objects/functions acted on in the recent past and the present

Infinitive: in order to do something

Past passive: actions performed in the past (**describing research method**)

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