



# Professional Basic English

## Lecture 11

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# Typical sections in a scientific article/thesis



- Abstract
- **Introduction**
- Background / Related Work / Literature Review
- Description of the work / study (Body):
  - Survey / tutorial paper: Thematic division in sections
  - Experimental paper: Methodology, Results
  - Theoretical paper: Phenomenon, Theoretical contributions
- Discussion, Conclusions



# Writing an introduction

- Literature: *Academic Essay Writing for Postgraduates, Unit 2. English Language Teaching Centre, University of Edinburgh, 2014*
- Common structure of introduction for short essays: *Situation – Problem – Solution - Evaluation*
  - May be in different order, or not always present
- In long texts (e.g. MSc thesis) the introduction needs to be more substantial and complex
  - In a thesis or other longer assignment, you need to present the findings of your own research (based on reading, observation or experimentation)
  - The introduction must justify your contribution to the field

# Stage 1: Orientation

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- General statements (especially on the importance of the topic)
  - *Denoising is one of the fundamental problems in image processing ...*
  - *In recent years, quantum computing has been studied extensively ...*
  - *There has been much interest in short range radio communications recently ...*
- Background information
  - Essential facts of the subject-matter that has to be known to understand the text – for example **definitions**
- Reference to previous studies
  - *Recent studies have shown that ...*
  - Not as comprehensive as the actual literature review



# Example of Stage 1

Most of the Internet traffic today stems from user-generated videos on sharing websites and social networks. The vast amount of user generated video content and the increased diversity of end user devices calls for a broad range of video quality to be supported. Automatic and accurate prediction of video quality is a basic operation for many video processing applications such as video quality monitoring in transmission protocols, video quality filtering in sharing services, automatic and recommended camera parameter settings during video capturing, and video enhancement. Specifically, no-reference methods attempt to judge the quality of a video sequence without any additional information about the original recorded scene. Such blind methods may apply machine learning techniques to learn from large amounts of annotated data.

# Stage 2: Justification

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- Indicating a gap
  - *This aspect of X has not been given much attention in the related studies ...*
  - *Surprisingly, only few studies on topic X has been published ...*
  - *The literature on X has concentrated principally on ...*
- Indicating questions/problems
  - Either direct or indirect questions: *But the question remains whether ...*
- Importance of the topic
  - Highlight the positive value or advantage of the topic
  - *The recent findings well deserve careful analysis ...*
  - *The elegant model merits testing with realistic test data ...*



## Example of Stage 2

However, current video quality assessment (VQA) databases contain only a small number of video sequences with little content diversity, thus offering limited support for designing and evaluating no-reference VQA methods effectively and fairly. Some databases capture imagery with a variety of cameras to encompass authentic video acquisition distortions, however, with content restricted to a small number of physical scenes. Most collections have not been found satisfactory in terms of content range and uniformity. Also the distortion variety was found lacking in most databases covering mainly compression and transmission, but not the many other types of natural distortions found “in the wild” [3].

# Stage 3: Focus on your paper (1)

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- Content: aims / central idea
  - *Our primary purpose is to ...*
  - *We will discuss / argue that ...*
  - *In this paper, we will present results of a pilot study ...*
  - *This paper investigates/describes ...*
- Structure
  - *This paper will first ..., and then ...*
  - *First, brief definitions of ... will be offered; second, the data and its analysis will be presented; third ...; finally*
  - In computer science papers, it is common to include in the last paragraph in the introduction: *the rest of the paper is organized as follows. First, ...; second ...; finally, the concluding remarks are given.*



# Stage 3: Focus on your paper (2)

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- Limitations
  - *Since ... is beyond the scope of this study ...*
  - *We will not attempt here to ...*
  - *Only the data from ... are considered in this study*
- Means
  - *Our approach is based on ... method*
  - *The present paper uses and extends the concepts introduced in ...*
- Evaluation
  - *... offers a possible explanation for ...*
  - *... which limits the use of the method ...*



## Example of Stage 3

To overcome these limitations we introduce VD-1, a large publicly available database of video sequences based on Yahoo Flickr Creative Commons 100 Million dataset [4] with a diverse set of video content. In this paper we report the filtering mechanisms and sampling procedures necessary to construct high-quality VQA databases of this kind, focusing on their usefulness in a variety of applications. Our database consists of diverse videos published by different users using various cameras with different shooting skills; hence the number of high quality videos is quite small. This will limit the diversity of quality in our database, thus influence the quality assessment performance.



# Example of Stage 3 - structure

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In the next section, we describe the database creation procedure and the set of attributes we have considered to maximise its diversity. Additional information regarding the removal of non-natural video sequences and sampling techniques are provided as well. Next, in Section III, we review our crowdsourcing-based process of collecting subjective mean opinion scores (MOS) and detail our results as well as crowd worker statistics. In Section IV we relate our database characteristics and creation methodology with other existing works and outline the differences, before discussing conclusions of our work and considering possible future work.



# Classroom task 1

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- Read the attached introduction. Can you find the three steps in them (orientation, justification and focus on your paper)? What is the research problem the paper tries to solve?



# Components of introduction

- According to *Academic Essay Writing*:
  - *Orientation – Justification – Focus on your paper*
- According to *Nature / Scitable* (nature.com/scitable):
  - *Context – Need – Task – Object of the document*
  - <https://www.nature.com/scitable/topicpage/scientific-papers-13815490/>
- How are those related to each other?



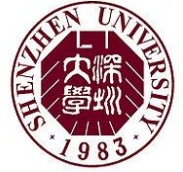
# Context and Need

- **Context** should appeal to a broad range of readers
  - Context is needed for readers to understand the need and its importance
  - You can anchor the context in time (use phrases such as “*recently*”, “*in the past 10 years*”, etc...
- **Need** emphasizes difference between current and desired situation
  - Best if direct continuation of the context
- Details should be left to literature review section!



# Task and Object

- **Task** covers what the authors have done
  - Use a verb to describe the research action: *we measured / calculated, ...*
  - Use past tense (the work is done already)
- **Object** emphasizes difference between current and desired situation
  - Use a verb to describe the communication action: *this paper presents / summarizes* etc.
  - Use present tense (the document is the subject!)
- Usually it is best to keep the task and the object separate



# Verbs for Task and Object

## Task

- Apply
  - We applied Smith's model to...
- Compare
  - We compared the effects of...
- Implement
  - We implemented a method for ...
- Model
  - We modeled a system for ...
- Simulate
  - We simulated a system for ...

## Object

- Clarify
  - This paper clarifies the role of ...
- Discuss
  - This paper discusses ...
- Explain
  - This paper explains the idea of ...
- Propose
  - This paper proposes a new method ...
- Summarize
  - This paper summarizes ...





# Classroom task 2

- Which verbs are for Tasks, which are for Objects?
  - Describe
  - Measure
  - Compute
  - Detail
  - Investigate
  - Present
  - Offer
  - Design
  - Provide



# Stages of writing (according to *Nature*)

- First, provide **context** to establish importance of your work
  - Similar to *orientation* in *Academic Essay Writing*
- Second, state the **need** for your work
  - Similar to *justification* in *Academic Essay Writing*
- Third, state what you have done to address the need (**task**)
- Fourth, preview the paper to prepare the readers for the structure and the **object**
  - *Task* and *object* similar to *focus on your paper* in *Academic Essay Writing*



# Summary

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- The depth of the introduction depends on the type of the writing
  - Short papers do not need as comprehensive introduction as a thesis
- Three main steps (*according to Academic Essay Writing*)
  - Orientation: general statements, background, previous studies
  - Justification: what is the research problem, why is this work needed?
  - Focus on your paper: aims, structure, limitations, method, evaluation
  - Similar advice in different terms in other sources (e.g. *Nature*)