

Learning Analytics Tools

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Lecture 10.1: Text Analytics

Welcome back to learning analytics tool course. In this week we will talk about text analytics. In last weeks we saw what are three levels of analytics, like a descriptive, diagnostics and predictive analytics. This week we will talk about text analytics. It is not one of them, but it is the application of natural language processing on educational data. Next two weeks, we will talk about applications, advanced topics in learning analytics.

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Content Analytics - Resource

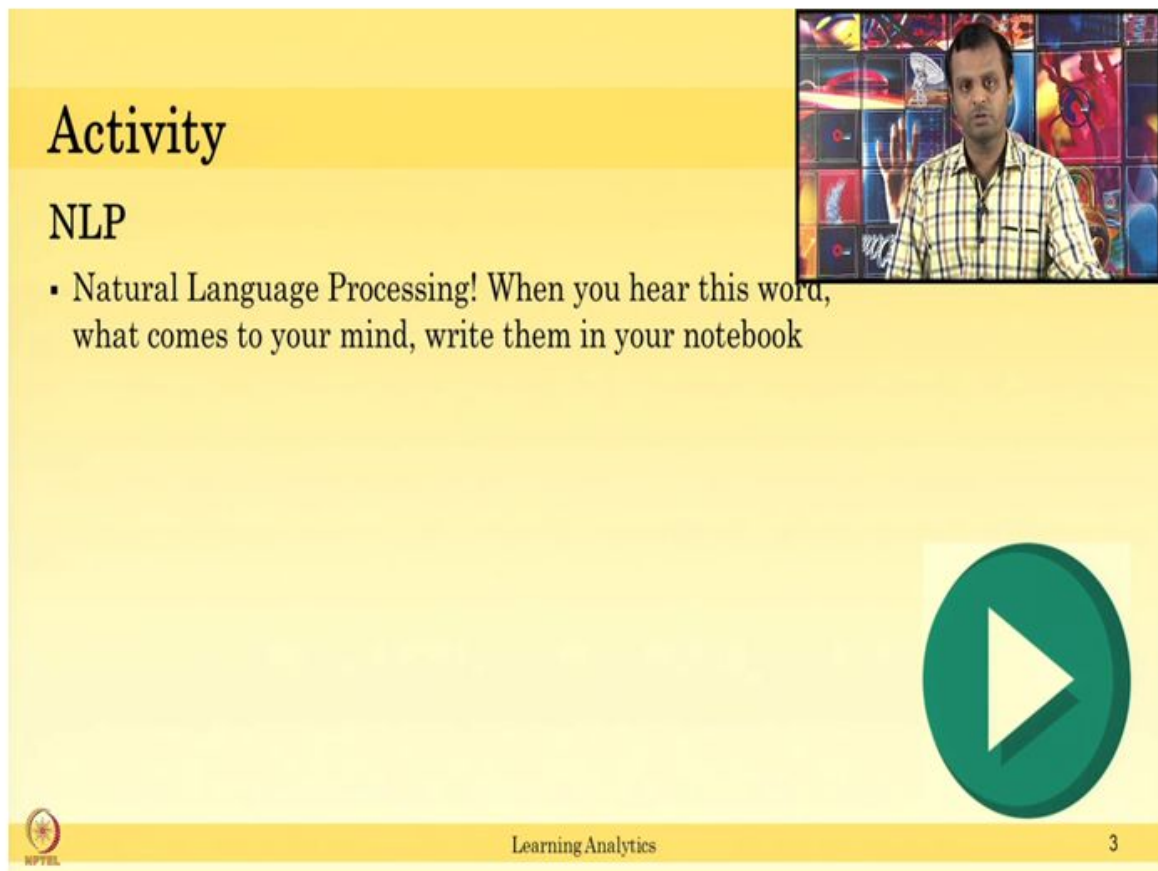
Chapter 7 and 8 in the book:

- Lang, C., Siemens, G., Wise, A., & Gasevic, D. (Eds.). (2017). *Handbook of learning analytics*. SOLAR, Society for Learning Analytics and Research.
- Chapter 7: [Content Analytics: The Definition, Scope, and an Overview of Published Research](#)
- Chapter 8: [Natural Language Processing and Learning Analytics](#)



So the content for this week can be from chapter 7 and 8 in the reference book in our course. So mostly it is for content analytics, it is natural language processing involved to analyze the text and we have a lot of content in our learning environment. Our learning environment has content, in the form of text or a lot of content is available. Can we use natural language processing to do something, this is content analytics. Let us see what is that.

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Activity

NLP

- Natural Language Processing! When you hear this word, what comes to your mind, write them in your notebook

In the bottom right corner, there is a large green circular play button icon. At the bottom left is the NPTEL logo, and at the bottom center is the text 'Learning Analytics'. The number '3' is in the bottom right corner.

Before we go on to this week's course when you hear the word natural language processing NLP what comes to your mind like, what you think about this. Do you know any applications of it? Have you heard this word? If you have never heard the word, it is okay. Please say you have never heard the word but if you have heard this word, what comes to your mind? Do you know where NLP has been applied? NLP is one of the key areas of artificial intelligence. It tries to mimic, write and read sentences understand sentences like a human do. So what comes to your mind please write it down and after writing it down resume to continue.

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Activity

NLP – What and its application

- Information Extraction
- Creating Q&A database
- Summarization
- Translation
- Chatbot and Personal Assistance
- Speech to Text
- Social media analysis – Sentiment analysis
- Sentence completion



So there are a lot of things possible, a lot of applications of NLP are there. Information extraction is the key, given a lot of big chunk of text, automatically identify the information from the text. For example, the phone numbers, address, the person name, the person position, what are the characters in that particular book, every information can be extracted.

Once you have extracted the information the key subject, object, what is the relation between these things, we can construct some map or construct a new story, shorten the story. So information extraction is the key, very important and challenging part too. And creating question and answer database, based on a chunk of data like a lot of students interacting in forums you can create a question and answers from that.

Or a lot of customers is giving reviews, or some customers talking about a particular product in a blog, so you can combine them and you can create a question and answer database so that

when a new customer wants to find the answer to something, they can check the question and this question can be easily picked up directly from the Q and A database which is automatically curretted from the existing website, or summarization.

It is like if you do not want to read a complete news article of say it takes five minutes, you can summarize into say ten sentences, takes only thirty seconds to read and understand the news article. So here it is like information extraction and creating the sentences in flow logically in the right sequence, right order.

Translation - this we use a lot of times because we translate from English to other language or because we use a lot of native languages. So translation is a very, very important application of NLP.

You might have thought about a chatbot or personal assistance. Nowadays, any website any service one website you open, there is a chatbot coming in, if you type something, it answers something. So it is basically based on your keyboard you are entering, it automatically picks up the equivalent answer or something like that. This chatbot is even getting more intelligent nowadays so that you can interact with the assistant like a Siri or Alexa or Cortana or something like that.

And speech to text, it is a very important part. The YouTube videos you might be watching or the videos you have watched, they have captions automatically coming out. It is all from speech to text. So they have a lot of training to happen for native language speakers. They are training on the person who is speaking. So a lot of things happening now to convert speech to text, in the English language. In social media, also in e-commerce media, if there is a product published, a product is released in the e-commerce or a product is launched.

And a lot of people have comments. The comment is positive or negative. It can be identified from the post. So sentiment analysis is possible. Suppose a movie is releasing a lot of people tweet about that. How that movie is going? The sentiment is positive or negative can be identified automatically by natural language processing by identifying the polarity of the words. what do the words mean?

Also if you type a word, it automatically completes the sentence, you might have seen in a Google or Gmail when you start typing the word it automatically completes the rest of the word right, so that is also an application of NLP and AI. So let us see what is NLP's application in the

education domain. So why we are talking about NLP, so we know NLP exists in the newspaper, news article characterization, or the Gmail spam filters, or we saw the chatbot, speech to text translations, but why we are talking about NLP in learning analytics.

It is because the content we are giving is still text format, we are not giving content in some other format. All the formats, content is text or video. So, we need NLP. Can we use NLP to do some adaptation there? What we saw till now was log data, student's interaction with the system, we never cared about the content we giving to a student.

What we thought till now is based on students interaction, the clicks, the traces, the answers, the performance to questions performed to service, these data we are used to predicting something or to diagnose or something is happening there, but can we use the content, can we apply some analytics on the content, that is how the text analytics is used for education. Let us talk about that in this link. Thank you.