

Course: Common Sense Reasoning

14. Understanding User Intentions

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There are applications that try to understand user intentions using common sense reasoning

- Inferring user intentions
 - BullySpace: Detecting cyber-bullying
 - Roadie: Helping use electronic devices
 - KitchenSense: Helping use kitchen appliances
- Inferring the implications of user intentions
 - Goose: Generating search-keywords from user intentions
 - What am I gonna wear?: Recommending clothes from user intentions

BullySpace is an application to detect cyberbullying

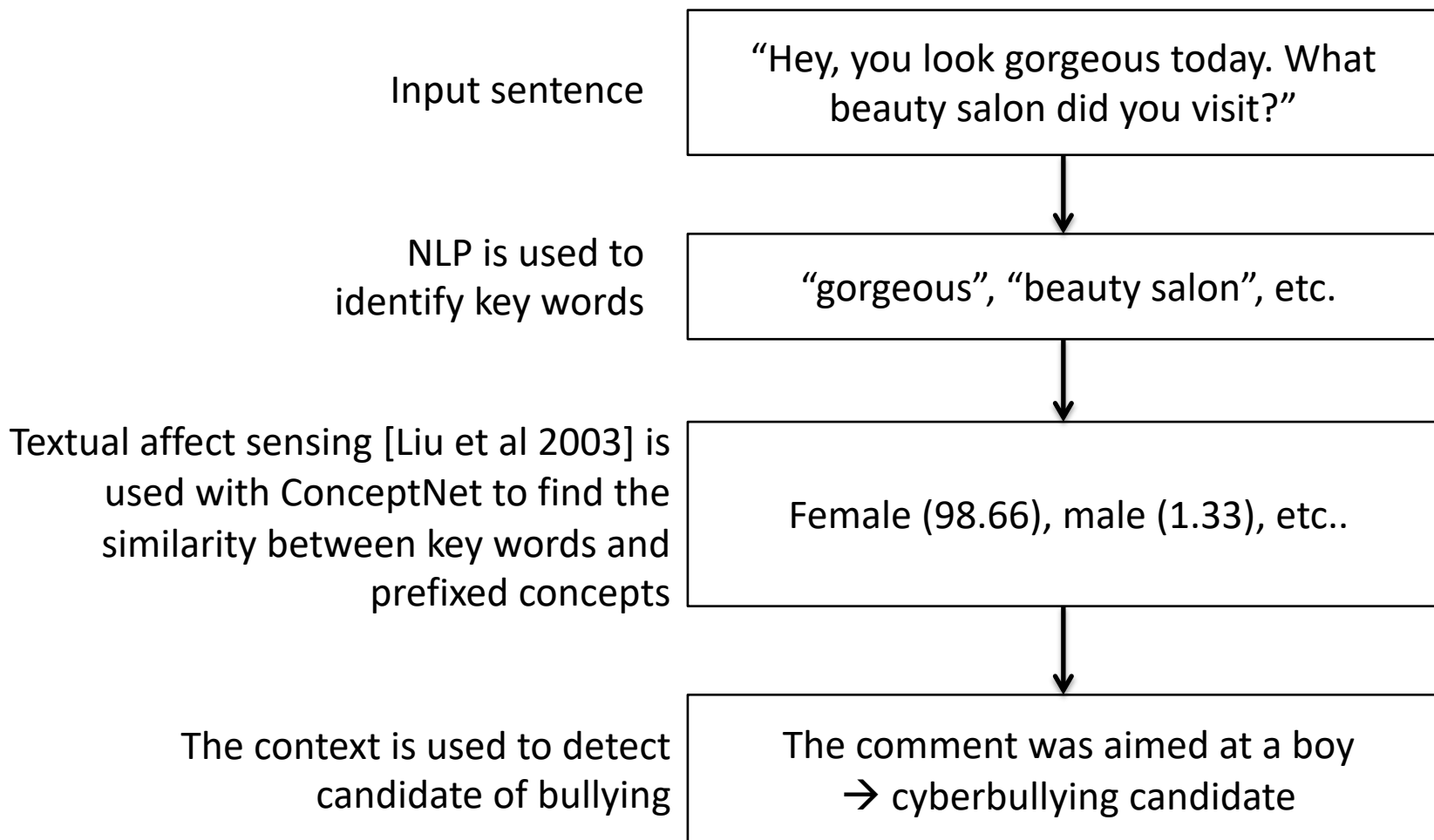


[Dinakar, et al 2012]

A sentence can be insulting depending on the recipient:

- Sentence "put on a wig and lipstick and be who you really are"
- This sentence is more likely to be an insult if directed at a boy than a girl

BullySpace uses ConcepNet



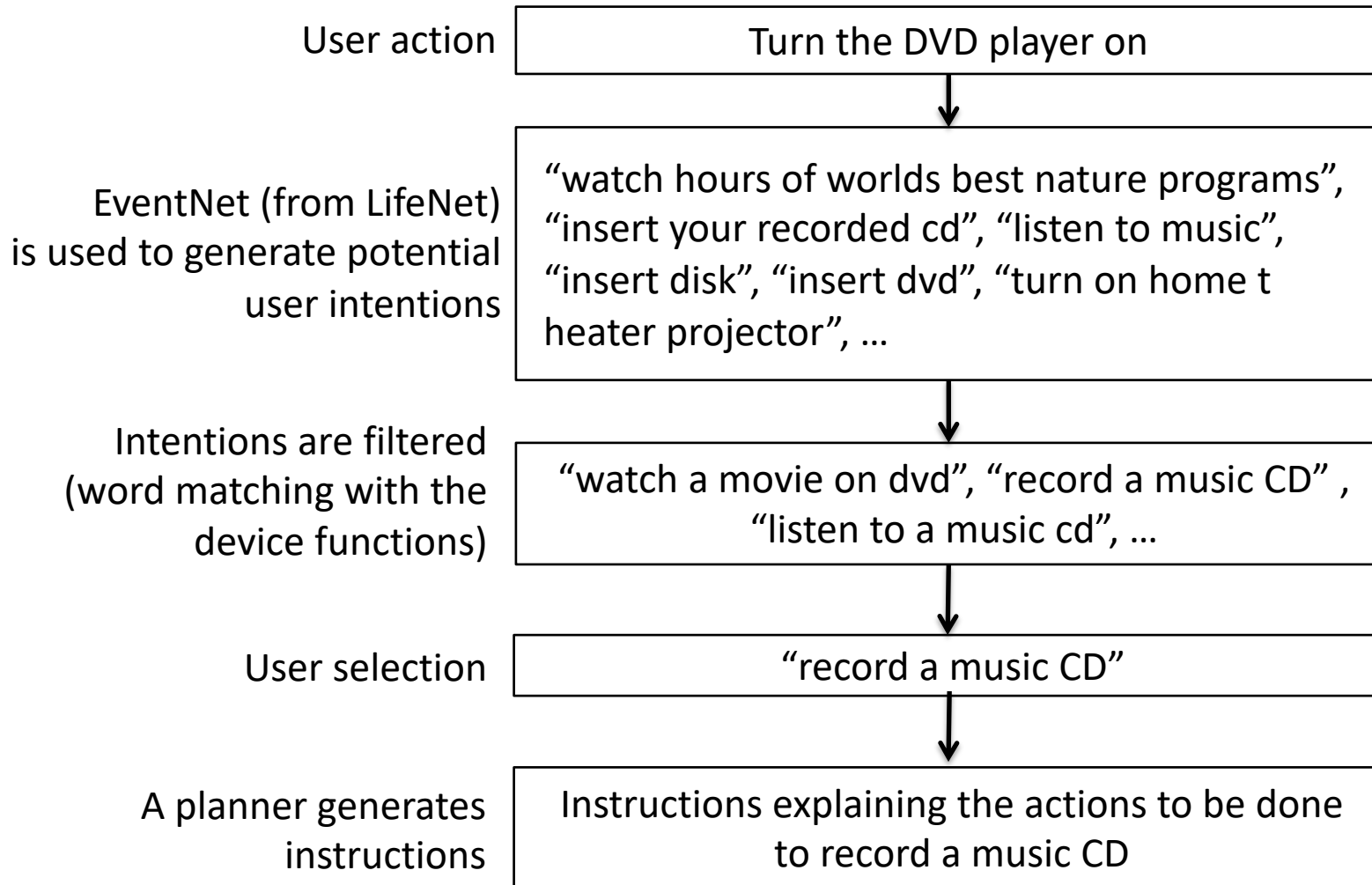
LifeNet is a knowledge base of ordinary human activity based on OpenMind

- Relates 80K propositions with 415K links
 - I-put-my-foot-on-the-brake-pedal → I-stop-a-car
 - I-pour-detergent-into-wash → I-clean-clothes
 - I-am-at-a-zoo → I-see-a-monkey
 - I-put-on-a-seat-belt → I-drive-a-car
- EventNet uses LifeNet to infer temporal relations between commonsense events

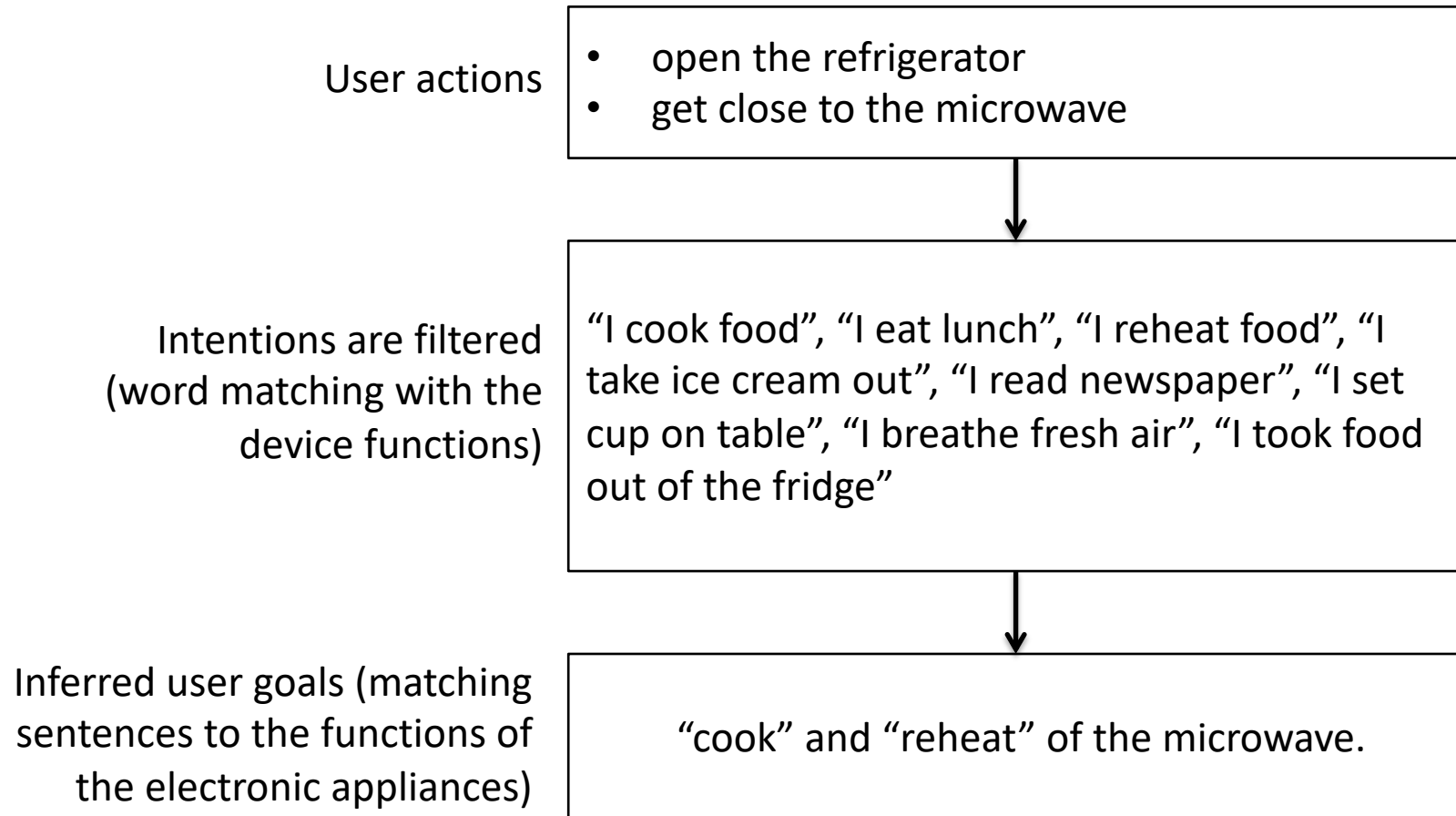
[Singh, Williams, 2003]

[Espinosa, Lieberman, 2005]

Roadie helps use electronic devices



KitchenSense helps use kitchen appliances



Common sense knowledge can be used to generate search-keywords from user intentions

User intention

Help solving this problem:
“Help me get rid of the mice in my kitchen”



Search keywords

“pest control”, “Cambridge”, “MA”

GOOSE is a search engine based on user goals

"I want "

<<< Use Commonsense Concepts? <<< Use Commonsense Investigator?
 <<< I typed in Natural Language. <<< Use Commonsense Generalizations?
 <<< Print context vector.

Alyssa searched the web for "help me get rid of the mice in my kitchen" --> Distilled into "rid mice kitchen"

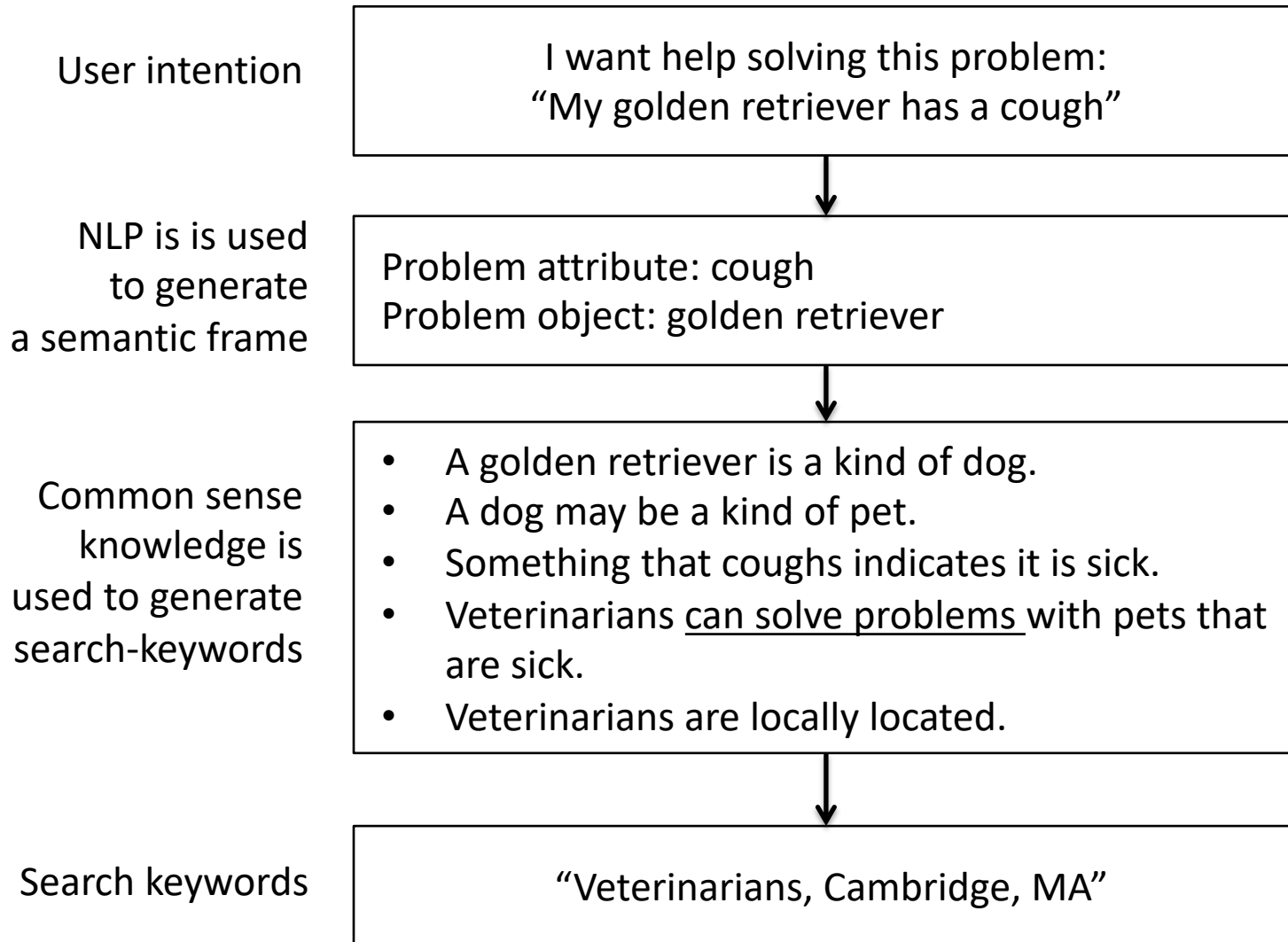
Alyssa investigated your query - **help me get rid of the mice in my kitchen** - and concluded that the solution is to look for: **"pest control" in Cambridge, MA**

Cambridge Pest Control Services
Description: 43% - Articles & General info: The Smart Cambridge Yellow Pages(cambridge... Cambridge Pest Control Services. Best Pest Control Services, Inc. 63 Elm St. Somerville, MA 02144. 617-625... Date Not Available)
http://cambridge.zami.com/Pest_Control_Services

PEST CONTROL - PEST MANAGEMENT
Description: 42% - Directories & Lists: Northeast Document Conservation Center 100 Brickstone Square Andover, MA 01810-1494 Tel:(978) 470-1010 Fax:(978) 475-6021. TECHNICAL LEAFLET. PRESERVATION SUPPLIERS AND

[Liu et al., 2006]

GOOSE uses common sense knowledge to generate search-keywords



“What am I gonna wear?” is a recommender system that uses common sense knowledge

The system recommends how to dress based on user intentions

The screenshot displays the 'What am I gonna wear?' web application interface. At the top, the user is logged in as 'Edward' and has entered 'my boss's birthday party' as the occasion. The interface is divided into several sections: 'My Profile' (showing user details like name, location, and age), 'My Wardrobe (39 items)' (a grid of clothing items with brand and type labels), 'What Should I Wear Today?' (a search area with a 'Function' and 'Style' slider), and 'Suggested Outfits (1/20)' (a list of recommended clothing items like 'sisley dress_shirt', 'calvin_klein sweater', and 'sisley blazer').

[Shen, et al., 2007]

Example

User intention

I am going to have dinner
with my boss

Recommended clothes



Common sense helps determine the similarity between input words and a tuple of words about the style of clothes

- Input words:
 - E.g., “I am going to have dinner with my boss”
- Tuple of words:
 - <“luxurious”, “formal”, “funky”, “elegant”, “trendy”, “sporty”>
- Method:
 - Textual affect sensing [Liu et al 2003] using ConcepNet

Recommender systems with common sense knowledge provide advantages

- User's intention as input:
 - “I am going to have dinner with my boss”
 - “I am going to the beach”
- Flexible input format
 - Open natural language communication as input

The described applications are experimental prototypes developed at the MIT



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MIT Media Lab

Reviewed applications:

- BullySpace
- Roadie
- KitchenSense
- Goose
- What am I gonna wear?

Other applications:

- Linking between text and images
- Affective structure of texts
- Automatic word completion
- Mobile phone applications
- Etc.

[Lieberman, et al., 2004]

Course “Common sense reasoning”.
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