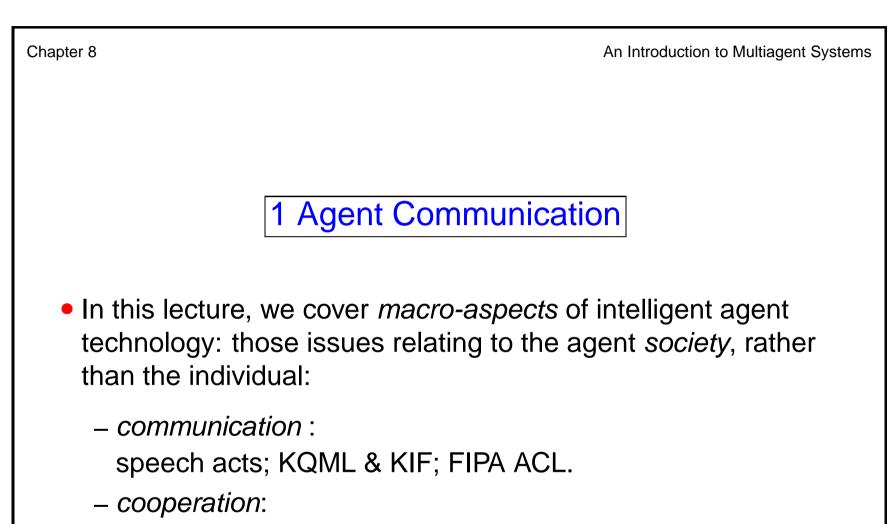
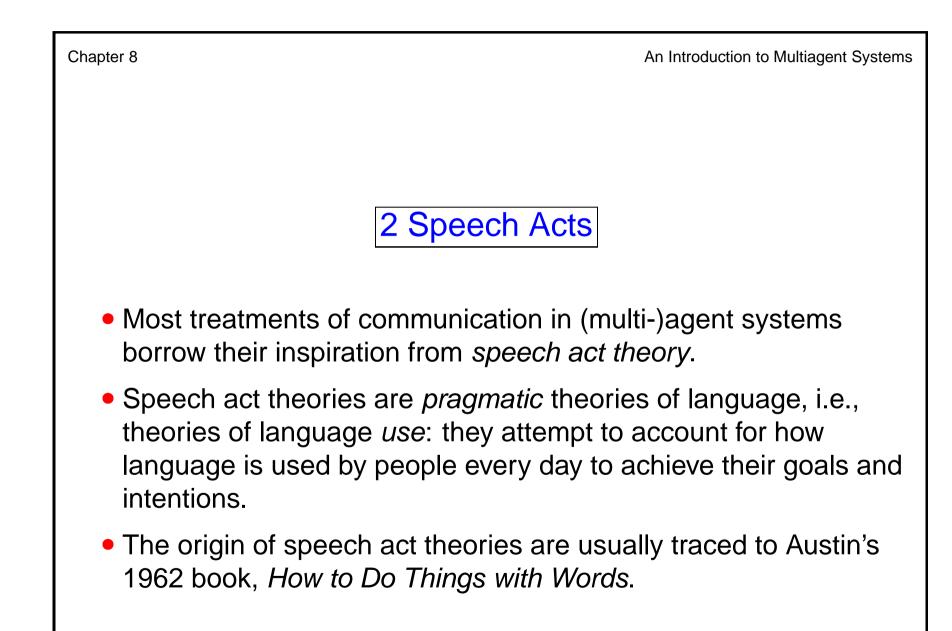
## CHAPTER 8: AGENT COMMUNICATION

An Introduction to Multiagent Systems

http://www.csc.liv.ac.uk/~mjw/pubs/imas/



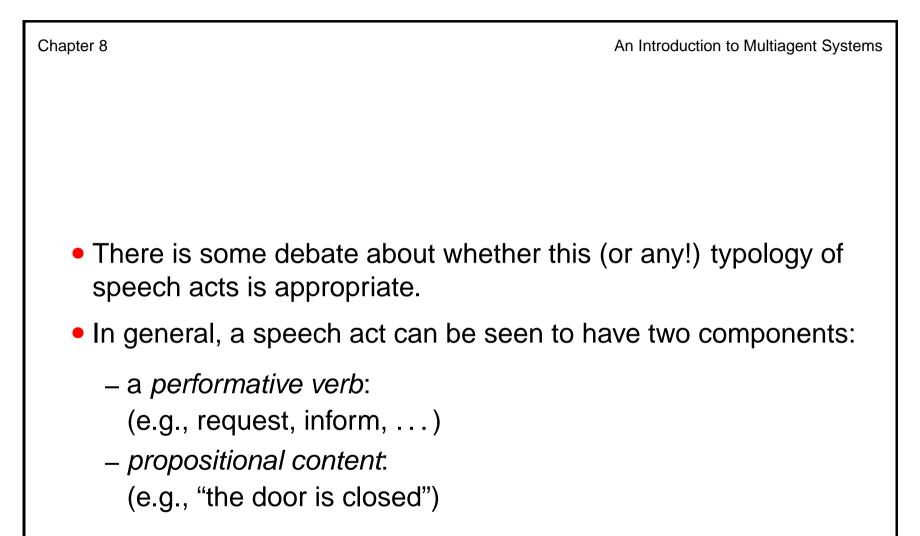
what is cooperation; prisoner's dilemma; cooperative *versus* non-cooperative encounters; the contract net.



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<ul> <li>Austin noticed that some utterances actions' that appear to change the st</li> </ul>	1 9
Paradigm examples would be:	
<ul> <li>declaring war;</li> <li>christening;</li> <li>1 now pronounce you man and wi</li> </ul>	fe' :-)
<ul> <li>But more generally, everything we ut intention of satisfying some goal or ir</li> </ul>	
<ul> <li>A theory of how utterances are used speech act theory.</li> </ul>	to achieve intentions is a

Chapter 8	An Introduction to Multiagent Systems
<ul> <li>Searle (1969) identified various</li> </ul>	different types of speech act:
<ul> <li>representatives:</li> <li>such as informing, e.g., 'It is</li> <li>directives:</li> <li>attempts to get the hearer to the tea'</li> </ul>	raining' do something e.g., 'please make
– commisives: which commit the speaker to to'	doing something, e.g., 'I promise
<ul> <li><i>expressives</i>:</li> <li>whereby a speaker expresse</li> <li><i>declarations</i>:</li> </ul>	s a mental state, e.g., 'thank you!'

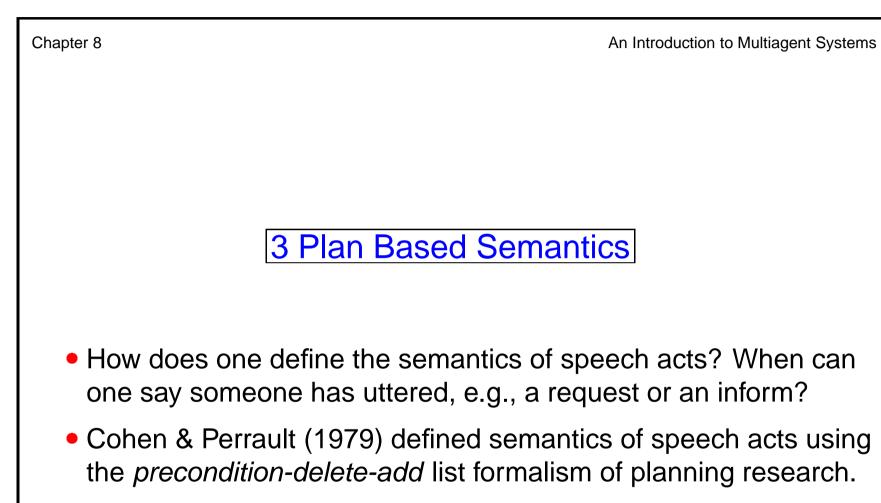
such as declaring war or christening.



## Chapter 8

## • Consider:

- performative = request
   content = "the door is closed"
   speech act = "please close the door"
- performative = inform content = "the door is closed" speech act = "the door is closed!"
- performative = inquire content = "the door is closed" speech act = "is the door closed?"



 Note that a speaker cannot (generally) force a hearer to accept some desired mental state.

Chapter 8	An Introduction to Multiagent Systems
<ul> <li>Here is their semantics for <i>request</i>. <i>request</i>(s, h, φ)</li> <li>pre:</li> </ul>	
– s believes h can do $\phi$ (you don't ask someone to do so they can do it)	mething unless you think
- s believe h believe h can do $\phi$ (you don't ask someone unless t	they believe they can do it)

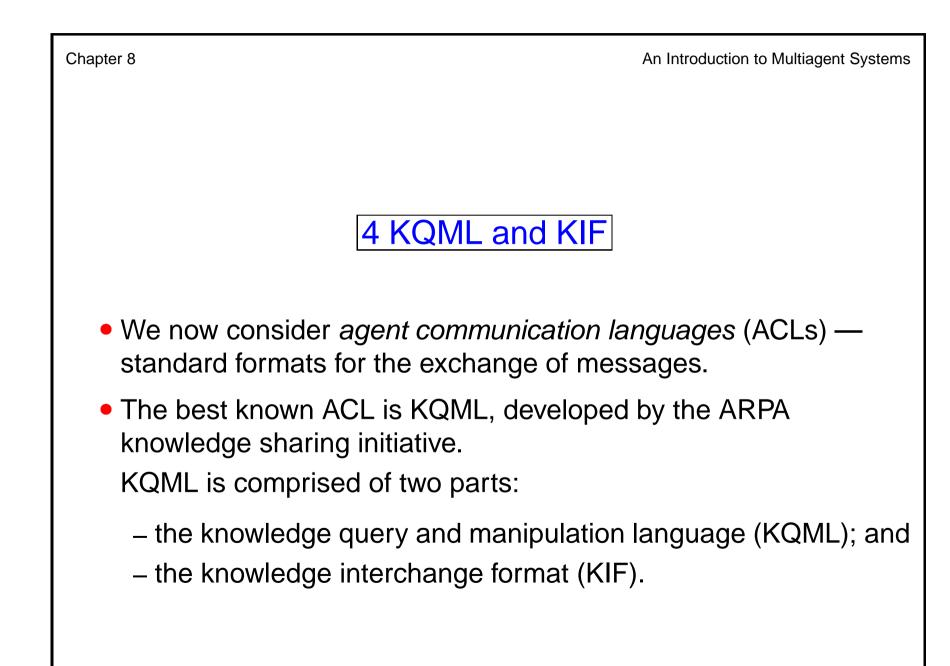
-s believe s want  $\phi$ 

(you don't ask someone unless you want it!)

post:

-h believe *s* believe *s* want  $\phi$ 

(the effect is to make them aware of your desire)



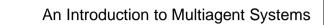
 KQML is an 'outer' language, that defines various acceptable 'communicative verbs', or *performatives*.

Example performatives:

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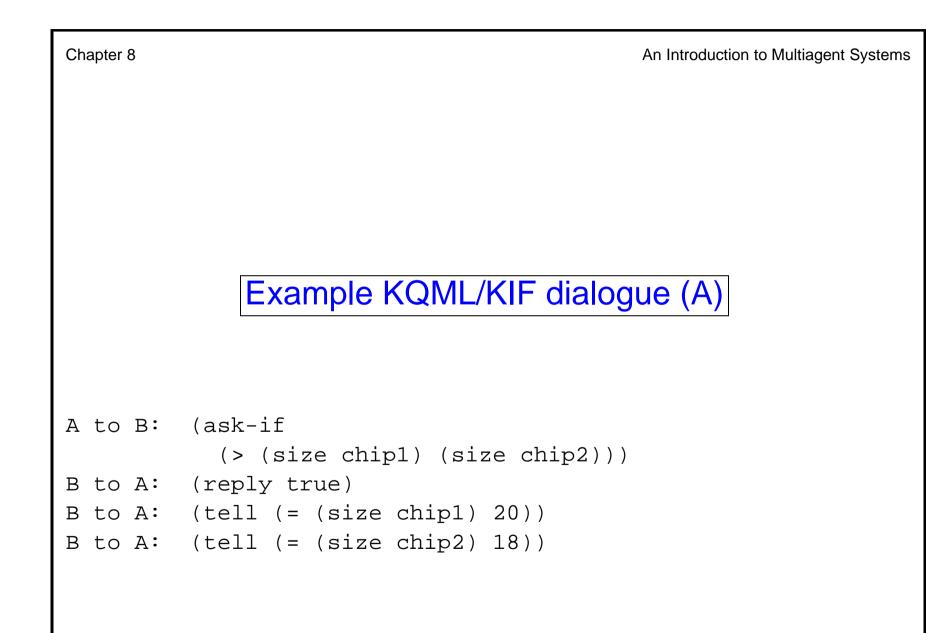
- ask-if ('is it true that...')

- -perform ('please perform the following action...')
- tell ('it is true that...')
- reply ('the answer is ...')
- KIF is a language for expressing message content.



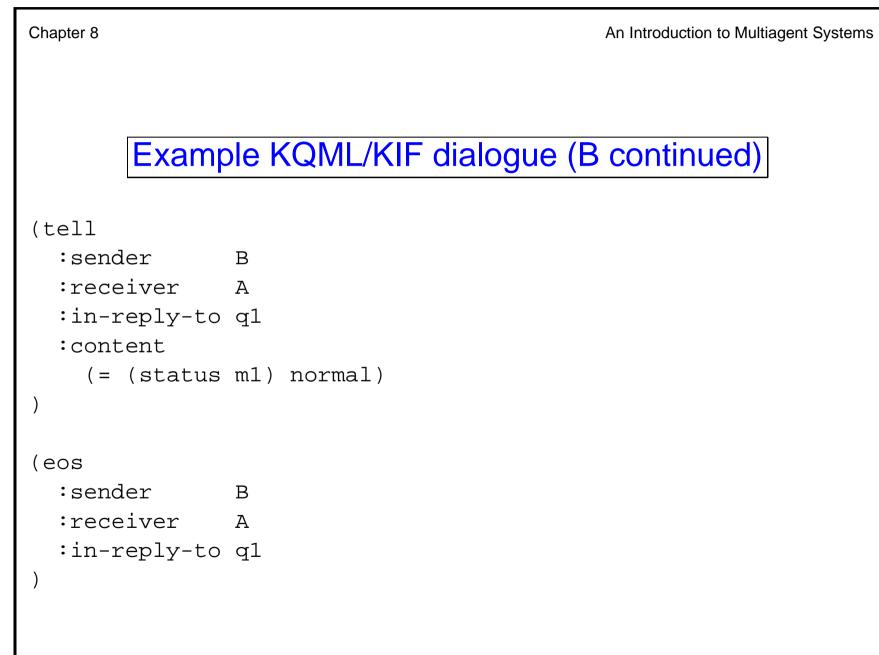
- In order to be able to communicate, agents must have agreed a common set of terms.
- A formal specification of a set of terms is known as a *ontology*.
- The knowledge sharing effort has associated with it a large effort at defining common ontologies — software tools like ontolingua for this purpose.

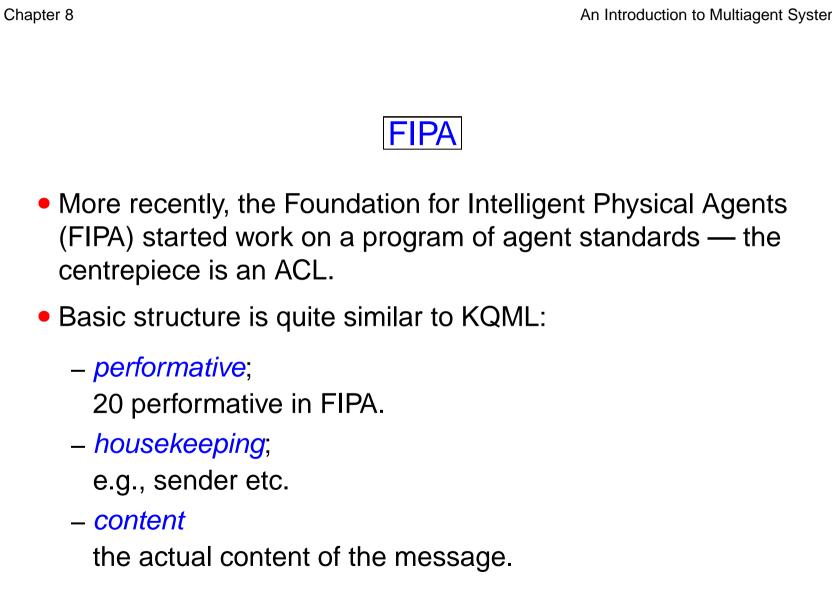
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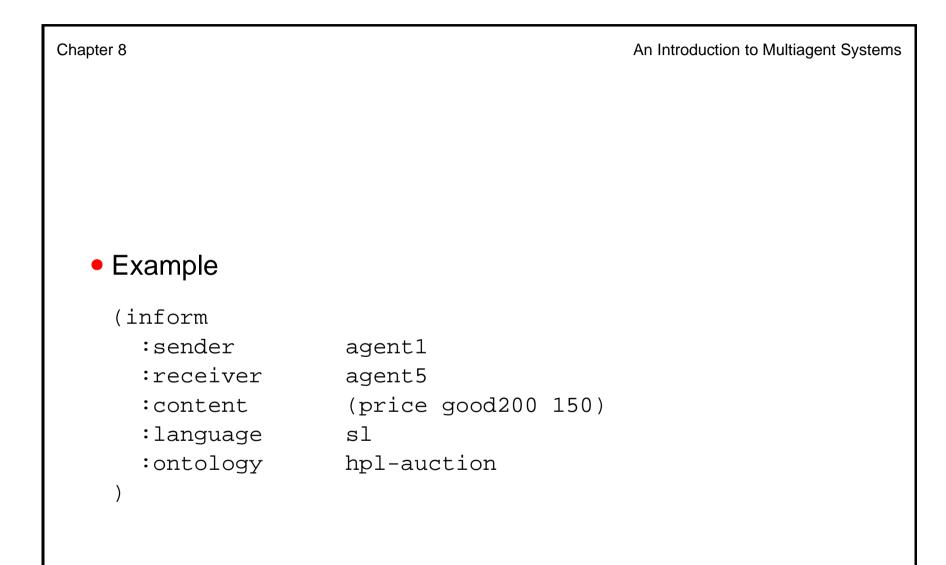


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Example KQML/KIF dialogue (B)								
(stream-about								
Sender	A							
:receiver	В							
:language	KIF							
:ontology	motors							
:reply-with	ql							
:content m1								
)								
(tell								
:sender	В							
:receiver	A							
in-reply-to:	q1							
:content								
(= (torque r	ml) (scalar 12 kgf))							
)								







Chapter 8 An Introduction to Multiagent Systems							
	performative	passing	requesting	negotiation	performing	error	
		info	info		actions	handling	
	accept-proposal			Х			
	agree				х		
	cancel		х		х		
	cfp			х			
	confirm	Х					
	disconfirm	Х					
	failure					х	
	inform	Х					
	inform-if	Х					
	inform-ref	Х					
	not-understood					х	
	propose			Х			
	query-if		х				
	query-ref		Х				
	refuse				Х		
	reject-proposal			Х			
	request				х		
	request-when				х		
	request-whenever				х		
	subscribe		x				

