

Information is Wealth:

Using Information from Virtual Human Interactions to Engineer Interpersonal Skills Training Experiences

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& Benjamin Lok

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Virtual Patients for Interpersonal Skills Training

- **Virtual Patient Simulations**
- **Virtual Patients** are computer-generated embodied conversational agents that play the role of a patient
- Have been used for training medical and health professions students with their interviewing and interpersonal skills
[Johnsen '07, '05, Stevens '05]





Open Ended Questions ▾

Close Ended Questions ▾

Type Here

Interview Progress

For Proficiency

Available

History of Present Illness - (0 / 5)

Medical History - (2 / 3)

Social History - (0 / 0)

Family History - (0 / 0)

Diet and Eating Habits - (1 / 3)

Important Discoveries

Prolonged mealtime

Suffered from a brain stem stroke

Takes Hydrodiuril

Hi



Hello Doctor.

How are you?



I'm OK, but I have been having problems swallowing.

What kind of swallowing problems do you have?



It takes me a long time to eat and I get tired while I'm eating.

When did the swallowing problems start?



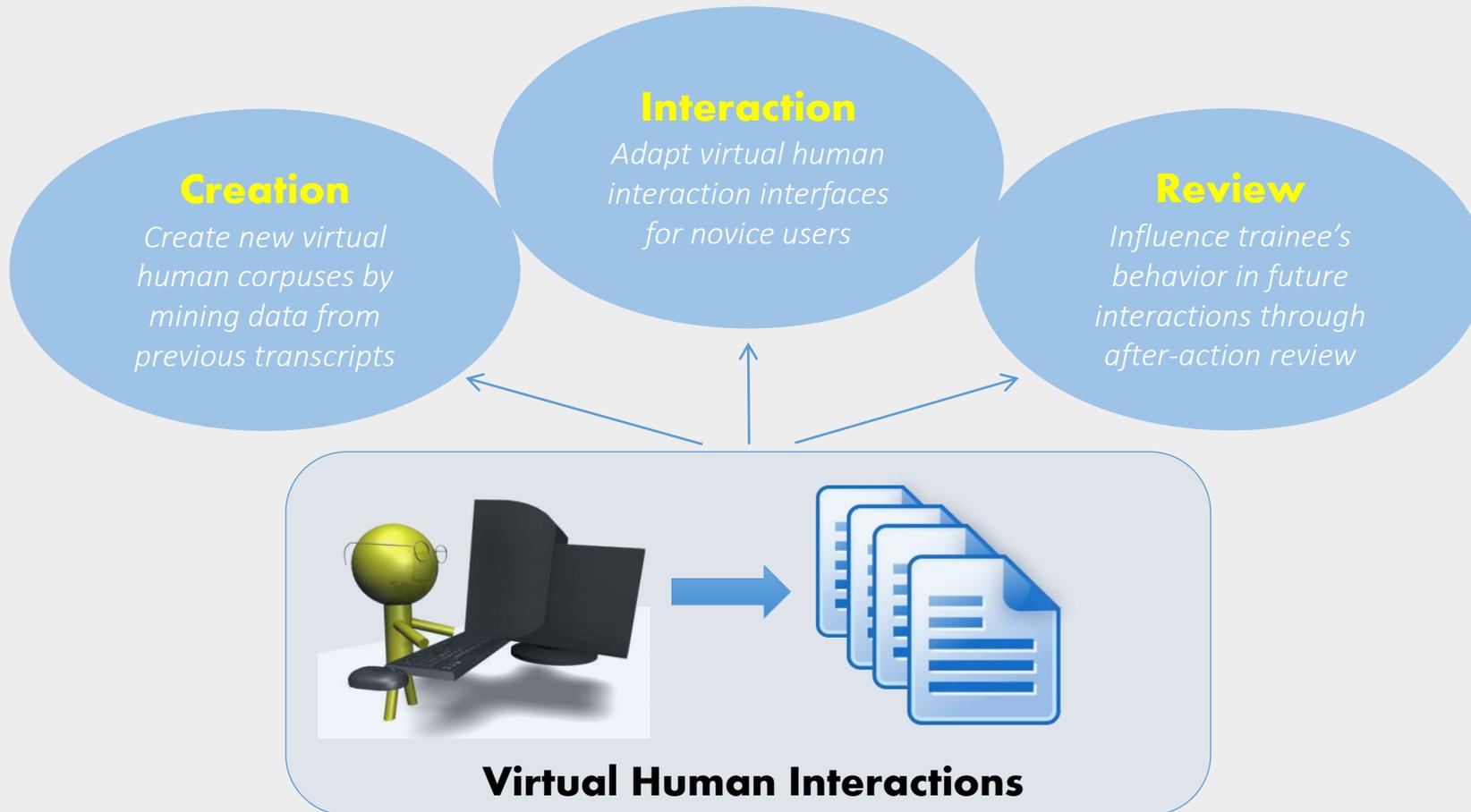
The swallowing trouble started a year ago when I had my brainstem stroke

Are you on any medications?



I'm taking Hydrodiuril.

Virtual Human Interaction Information



Bootstrapping Virtual Human Creation using Information from Virtual Human Interactions

Constructing conversational virtual humans...

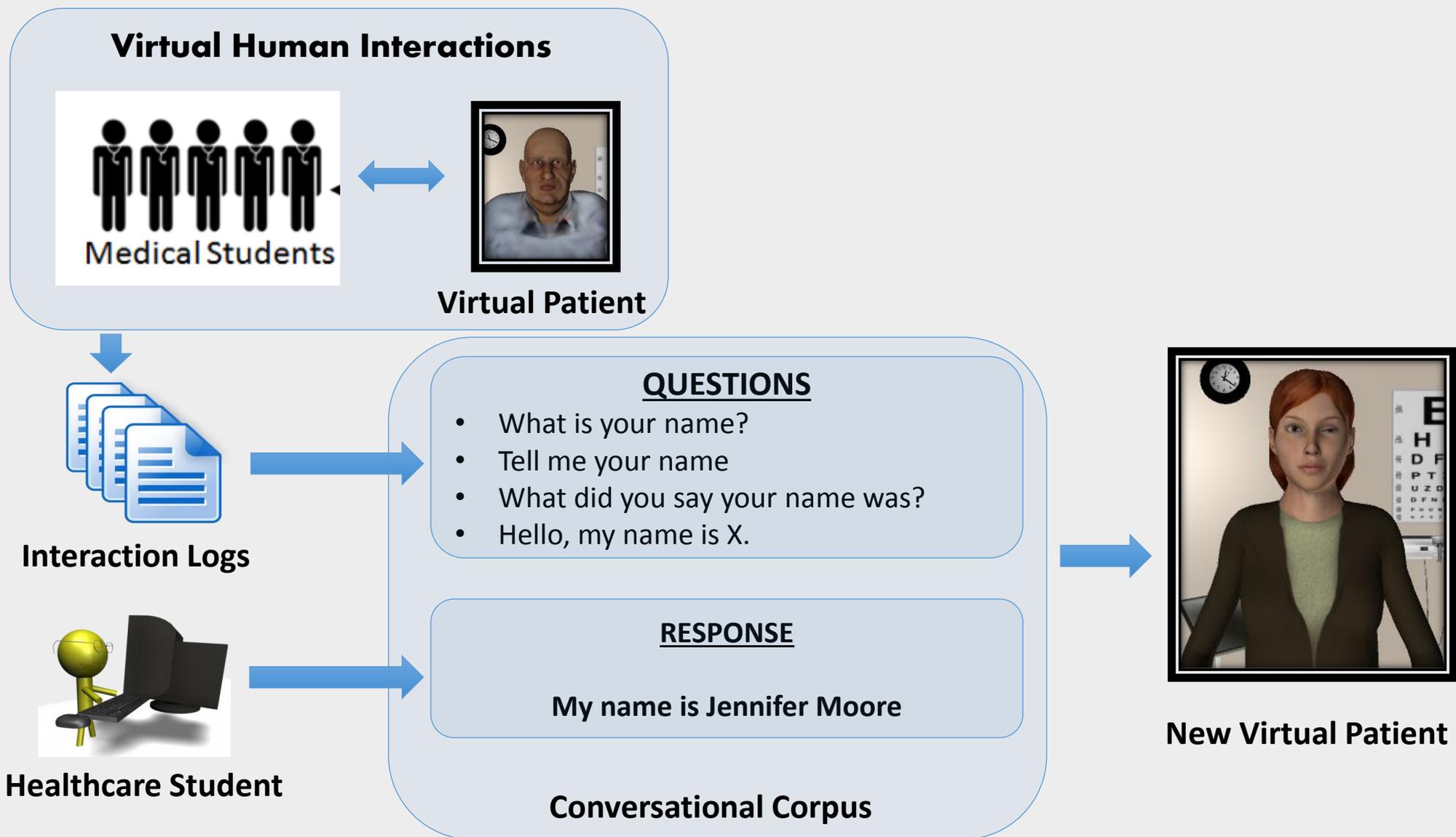
- ... is time-consuming!
- Question-answering virtual humans
- Constructed using a **conversational corpus**
- Conversational corpus is a collection of questions and responses

Conversational Corpus

Question : What is your name?

Response : My name is Vinny Devito.

- What is your name?
- Could you please tell me your name
- And you are?
- Are you Mr. Vinny Devito?
- Can I have your name?
- Can I just ask you your name first of all?
- May I ask you your name please?
- My name is Shiva Halan.
- What's your name?
- And what did you say your name is?
- Tell me what your name is.
- I didn't get your name.
- Hi and you are?
- May I ask your name?
- What was your name again?



Basic Info

Name

Jonathan Hart is Asked : " What is your name? " ...

Jonathan Hart Responds : " My name is "

Set the text box blank to **remove** 5 Responses and 24 Questions

OR [Click to enter your own response](#)

**Pre-populated
questions for response**

What is your name?
Name.
Could you please tell me your name.
And you are.
Are you Mr. **Jonathan Hart**
Can i have your name.
Can i just ask your name first of all.
May i ask your name please.
My name is .
What your name is?
What's your name.
Your name.
Your name is.
Could you please tell me your name.
And what did you say your name is.
Hi and you are.
I did not get your name.
I didn't get your name.
I'm sorry i didn't get your name.
May i ask your name.
Sorry i forgot to get your name.
Tell me what your name is.
Your name was.
What was your name again?

Virtual Patient Creation by Healthcare Students

Why have students create virtual patients?

- Students are forced to think from the patient's perspective
- Different types of virtual patients can be created to immerse students into different perspectives
- The virtual patients created can be shared with other people for feedback

Course Integration - Feasibility

Year of Study	No of Virtual Patients Created	Avg. # of Questions	Avg. # of Responses	Creation Time (per patient in hours)
2011 (Pilot)	7	1193.17	370.00	3.8
2012	18	1044.60	214.90	4.9
2013	15	933.80	203.70	3.2
2014	50	920.92	142.30	5.4
2015	11	932.18	145.73	2.0
Average	101	1004.93	215.33	3.86

Adapting Virtual Human Interactions for Novice Users



Adapting VH Interactions for Novice Users

- How to target VH interactions for different user populations?
 - Novices talk to VPs differently than experts do [Kenny 2009]
- Solution: Use previous novice interactions

Adapting VH Interactions for Novice Users

Date	Character	Speech
1/27/2015 7:41:33 PM	DM15MGTEST02	Hi, Marty.
1/27/2015 7:41:34 PM	Marty Graw	Hello.
1/27/2015 7:41:44 PM	DM15MGTEST02	How are you doing?
1/27/2015 7:41:44 PM	Marty Graw	I'm doing alright, but I wish I was better. I'm having difficulty swallowing. Discovery: Chief Complaint: Difficulty while swallowing
1/27/2015 7:41:52 PM	DM15MGTEST02	How long have you been having this problem?
1/27/2015 7:41:53 PM	Marty Graw	About a month. Discovery: Onset: About a month ago
1/27/2015 7:41:57 PM	DM15MGTEST02	When did the problem begin?

Team Training for Virtual Healthcare Professionals



Virtual Healthcare Professionals



In Simulation









Questions?



Questions?



Virtual Patient Creation by Healthcare Students

How are these virtual patients created?

- Students focus only on creating the verbal or conversational part of the virtual patient by constructing a conversational corpus
- A conversational corpus consists of **questions** asked to the virtual patient and **responses** made by the virtual patient
- Students come up with all the responses for the virtual patient by filling out a **template** that has the questions pre-populated

Virtual Patient Creation by Healthcare Students

How are these virtual patients created?

- Templates help create only an initial version of the virtual patient
- This initial virtual patient can be improved iteratively by having more people interact with the virtual patient
- Human-centered distributed conversational modeling