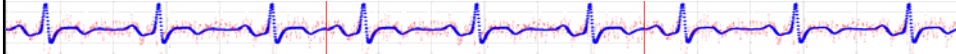


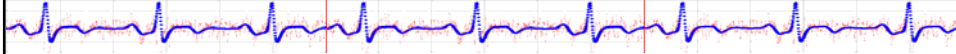
# AAAI Fall Symposium on Dialogue Systems for Health Communication



Welcome

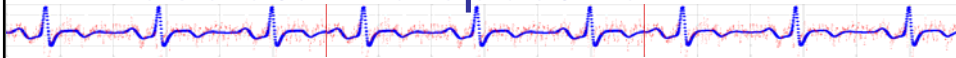
Timothy Bickmore  
Boston University School of Medicine

## Overview



- Motivation
  - Societal
  - Scientific
  - Community
- Some interesting research directions
- Logistics

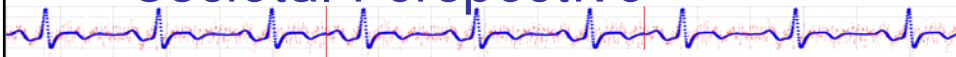
# Motivation: Societal Perspective



- This is important work
- US Healthcare expenditures \$1.2T
- 60% attributable to behavioral problems
  - Tobacco kills 435,000 people per year in US
  - Poor diet & physical inactivity kill 400,000/year in US
  - 64% of US adults are overweight or obese
  - 40% of chronic disease patients (45% of US) are non-adherent or poorly adherent
- Aging population
  - Chronic disease prevalence increasing
  - Shortage of healthcare workers
  - "Aging in place"



# Motivation: Societal Perspective



A screenshot of the MIT FitTrack software interface. The window title is "MIT FitTrack" and "Exercise Advisor". It features a green progress bar at the top, followed by a prompt to "Log your activity for Tuesday, April 30". Below this, there are input fields for "Went to bed at:" and "Got out of bed at:", each with a time selection dropdown. A "Morning Activity" section follows, with three rows for "Moderate", "Hard", and "Very Hard" activity levels, each with "Hour" and "Minutes" dropdowns. At the bottom, there are three radio button options: "No, no problems this week.", "Yes, I had a few problems exercising this week.", and "Yes, I had some significant problems exercising this week." The interface also includes a small avatar of a woman with dark hair.

## Motivation: Scientific Perspective

- “Gold standard” of health behavior change & education is 1-on-1 counseling
- Emulating this as closely as possible implies autonomous systems that interact with patients using dialogue (and nvb)
- Vast literature on provider-patient communication (AAPP)



## Motivation: Scientific Perspective

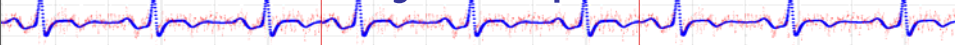
- Very rich set of phenomena to study
  - Negotiation of treatment regimens
  - Relational communication
  - Affective/empathetic communication
  - Long-term interactions
  - Long-term engagement
  - Understanding pt's disease model
  - Patient activation

## Motivation Community Perspective



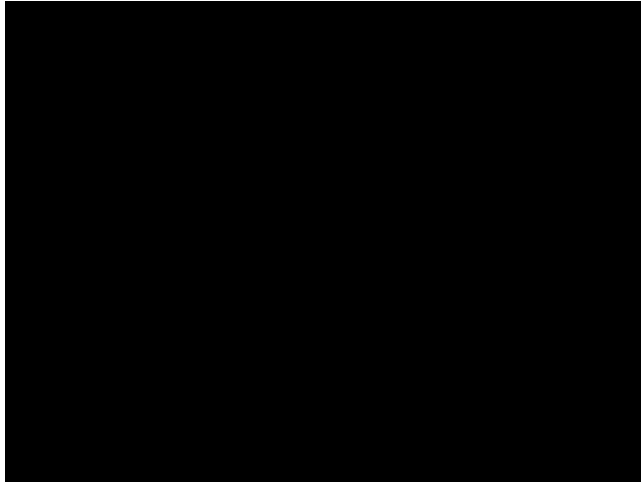
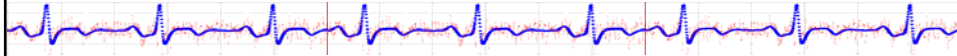
- 80+ researchers
- 10++ companies
  - Pharmaceuticals
  - Gaming
  - AI
  - Health media
  - Robotics

## Motivation: Community Perspective



- Some Active Research Areas
  - Health Behavior Change
  - Health Education
  - Medication Adherence
  - Chronic Disease Self-Management
  - Assisted Cognition/Cognitive Orthotics
  - Eldercare

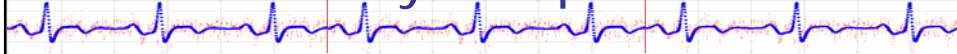
## Example dialogue system: Medication Advisor



George Ferguson  
Univ of Rochester  
~2002

Medication Adherence

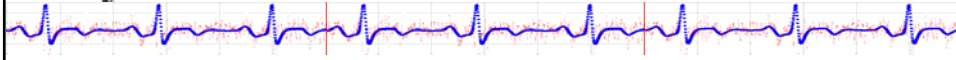
## Motivation: Community Perspective



- Professional organizations
  - American Medical Informatics Association
    - NLP SIG
    - Consumer Informatics SIG
  - Society for Behavioral Medicine
    - Behavioral Informatics SIG



www.gamesforhealth.org



BG Pilot (helps kids with diabetes keep track of blood glucose,  
in a game format), (PC) 1989  
AIDS Avenger, (PC) 1991  
Captain Novolin (diabetes self-management), (SNES) 1992  
Rex Ronan (smoking prevention), (SNES) 1993  
Packy & Marlon (diabetes self-management), (SNES) 1994; (PC) 1998  
Bronkie the Bronchiasaurus (asthma self-management), (SNES) 1995; PC 1999  
Alter Ego (Activision by Dr. Peter Favaro)  
Mind Mirror (EA by Timothy Leary)  
...

## ResponDesign Yourself!Fitness

yourself  
fitness

yourself!fitness.:

commitment.:

community.:

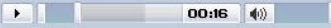
Yourself!Fitness  
brings the expertise  
of a certified  
personal trainer and  
nutritionist into your  
home to guide you  
through a  
personalized health  
and fitness program.



maya  
personal trainer



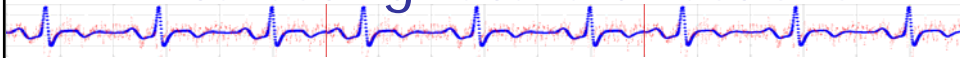
see the big picture.:



forum headlines

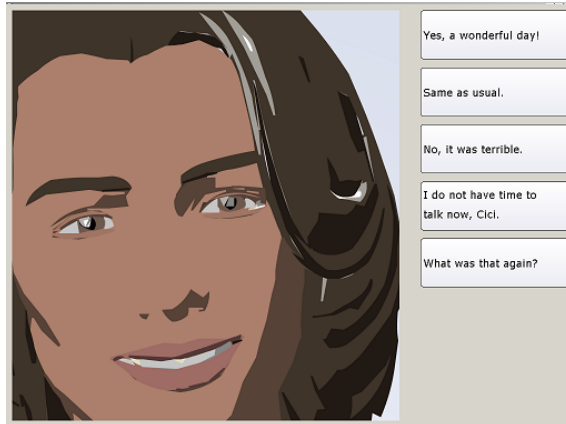
- .: "Review from IGN"
- .: "RE: Goal Update for adamdick!"
- .: "RE: Eating Healthy at Work"
- .: "RE: conditioning"
- .: "Instead of Avoiding Certain Foods - Seek Out the Good Stuff"
- .: "Embrace Your Shape... For Real This Time"
- .: "RE: BHANGRA Rhythms Are the Newest Sweaty Aerobics Rage"

# Interesting future directions

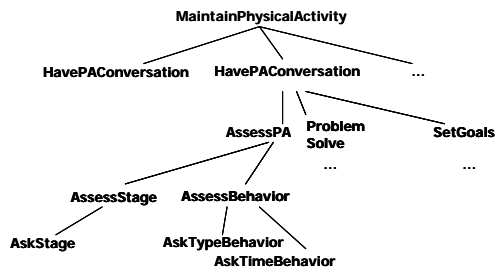
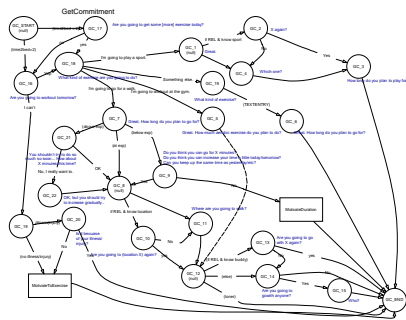
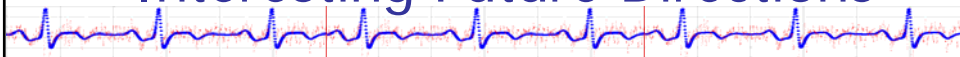


**Relational Agents**

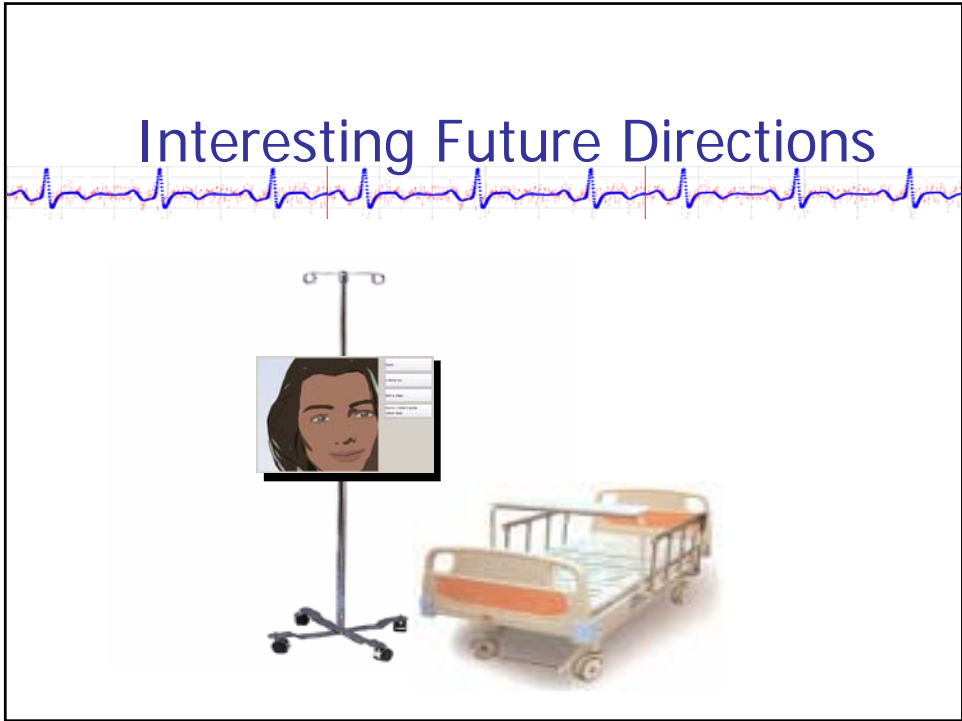
**Caring Machines**



# Interesting Future Directions



## Interesting Future Directions

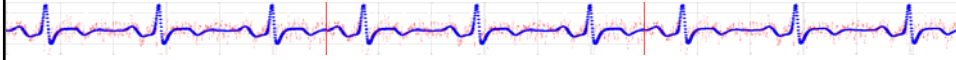


## Interesting Future Directions



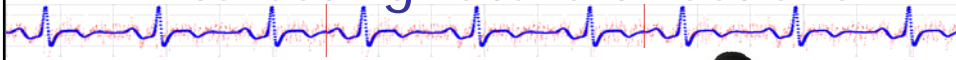


# Interesting future directions NurseBot



U of Pittsburg  
School of  
Nursing  
  
CMU  
  
U of  
Michigan

# Interesting future directions



## Motivation: Why a symposium?

- Critical mass of researchers
- Common interests, tools, data, methods
- AAAI Symposia a great venue

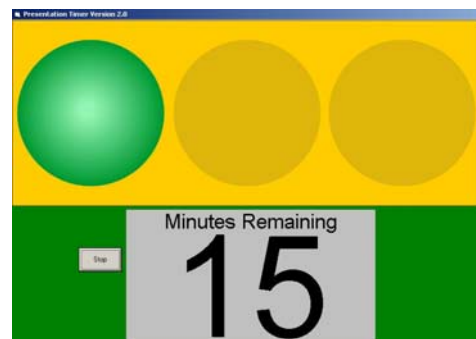
## Logistics: Schedule

All 8 Symposia on common break schedule.

Must keep to schedule to get our snacks.

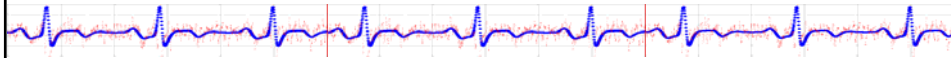
Suggest:

- Leave 10 minutes Q&A
- Notices at 10, 5
- Stage hook at 0



# Friday

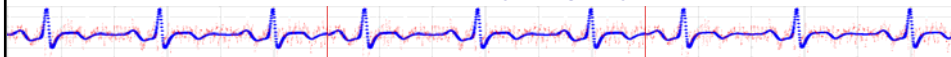
Breaks: Ballroom level Reception: Regency Ballroom A/B



- 9:00-** Welcome & Introduction (Tim Bickmore)
- 10:30** Keynote: Experiences with Telephone-Linked Care (Rob Friedman)
- 
- Session Chair: Toni Giorgino
- 11:00-** Paper: A Pedagogical Agent for Psychosocial Intervention on a Handheld Computer (Lewis Johnson)
- 12:30** Paper: Retrofitting Synthetic Dialog Agents to Game Characters for Lifestyle Risk Training (Susann Luperfoy)
- Paper: The Transonics Spoken Dialogue Translator: An aid for English-Persian Doctor-Patient Interviews (David Traum)
- 
- 2:00-3:30** Demos (David Traum, Susann Luperfoy, Kevin Ludena, Tim Bickmore)
- Paper: Using a Domain-Independent Reactive Planner to Implement a Medical Dialogue System (Reva Freedman)
- 
- 4:00-5:30** Session chair: Stacy Marsella
- Paper: A Triage Information Agent (TIA) based on the IDA Technology (Stan Franklin)
- Paper: A Synthetic Character Application for Informed Consent (Rob Hubal)
- Keynote: Wearable Relational Devices (Rosalind Picard)
- 
- 6:00-7:00** Reception

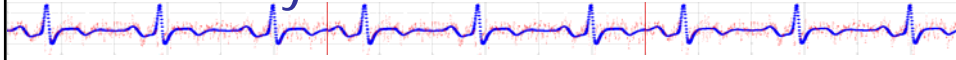
# Saturday

Breaks: Ballroom level Plenary: Regency Ballroom A/B



- 9:00-** Keynote: Experiences with HealthBuddy (Geoffrey Clapp)
- 10:30** Paper: The Role of "Etiquette" in an Automated Medication Reminder (Peggy Wu)
- 
- Session Chair: Lewis Johnson
- 11:00-** Paper: Communication of Uncertainty in Clinical Genetics Patient Health Communication Systems (Nancy Green)
- 12:30** Paper: Voice Pathology Assessment based on a Dialogue System and Speech Analysis (Rosalynd Moran)
- Paper: Detection of Neuropsychiatric States of Interest in Text (Robert Bechtel)
- 
- 2:00-3:30** Challenge problem: Life-long engagement for chronic disease management (Bickmore)
- Paper: Integrating Public Health and Computer Science Theoretical Perspectives for Developing Tailored Health Messages (Rita Kukafka)
- 
- 4:00-5:30** Paper: E-Health as Dialogue: Communication and Quality of Cancer Care (Linda Harris, Gary Kreps)
- Panel: What's Unique About Health Dialogue? (Moderator: Susann Luperfoy)
- 
- 6:00-7:30** Plenary Session (Candy Sidner presenter)

# Sunday



Session chair: Stacy Marsella

**9:00-10:30** Paper: Talking Telemedicine: Is the Interactive Voice-Logbook Evolving into the Cornerstone of Diabetes Healthcare? (Leslie-Ann Black)

Paper: An Assistive Conversation Skills Training System for Caregivers of Persons with Alzheimer's Disease (Nancy Green)

Paper: Evaluation and Usage Patterns in the Homey Hypertension Management Dialog System (Toni Giorgino)

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**11:00-12:30** Panel: Towards a Community - Shared Tools, Corpora and Dialogue Scripts (Moderator: Neal Lesh)

Wrapup & Future Actions (Bickmore)