

Robot Interaction Inspired by Theatrical Techniques

**David V. Lu
Washington University
in St. Louis**

HRI Pioneers 2010

Two Worlds

Computer Science

Algorithms

Order

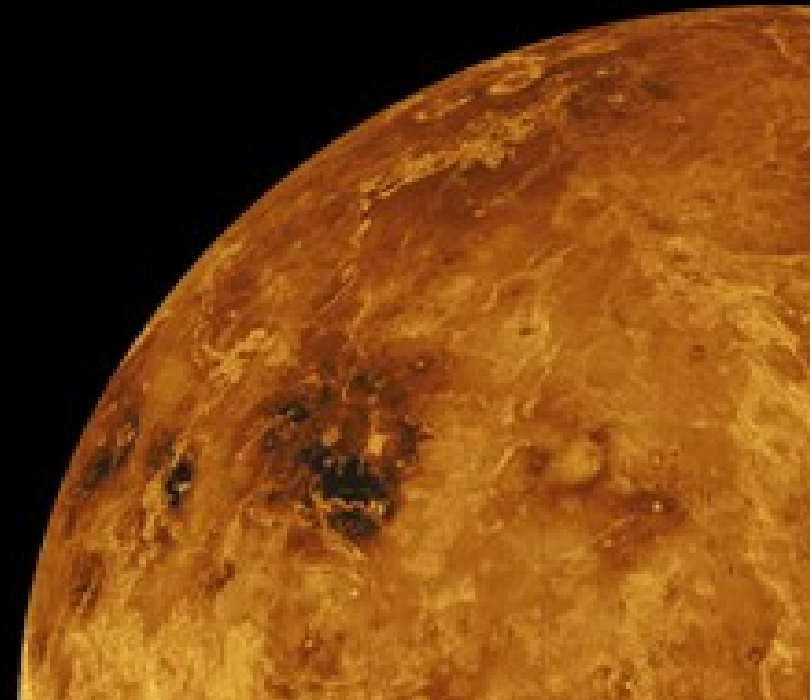
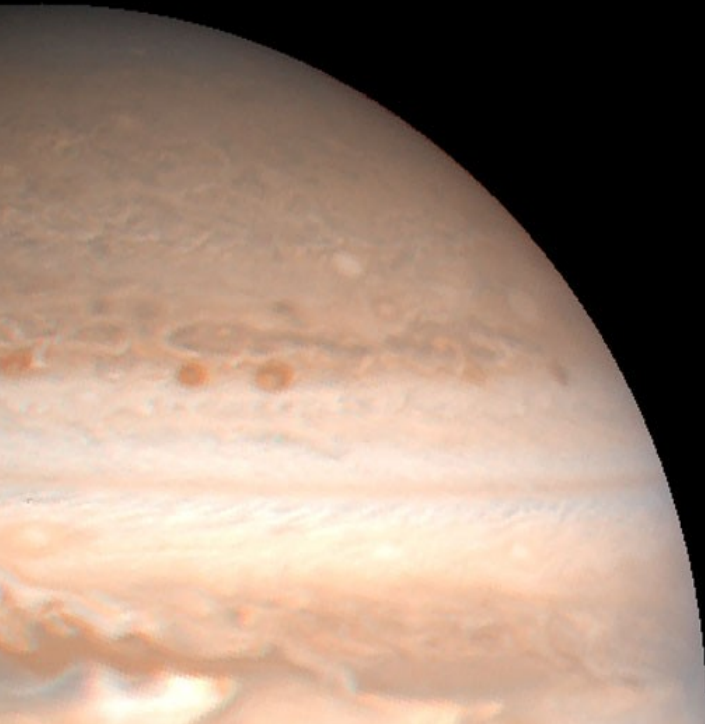
Quantifiable Results

Theatre

Experience

Conflict

Audience Response



Robots in Theatre

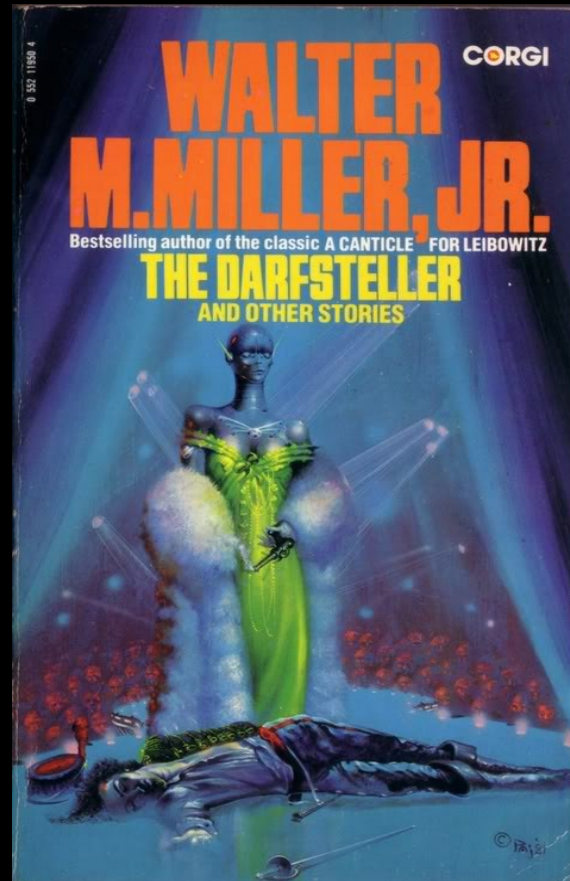
Theatre in Robotics



Modified from Pixar's WALL-E



*R.U.R. Rossum's
Universal Robots*
by Karel Capek, 1921
(Vortex Summer
Youth Theatre 2009)



The Darfsteller
by Walter M. Miller Jr.,
1955

Calculon from *Futurama*
2000



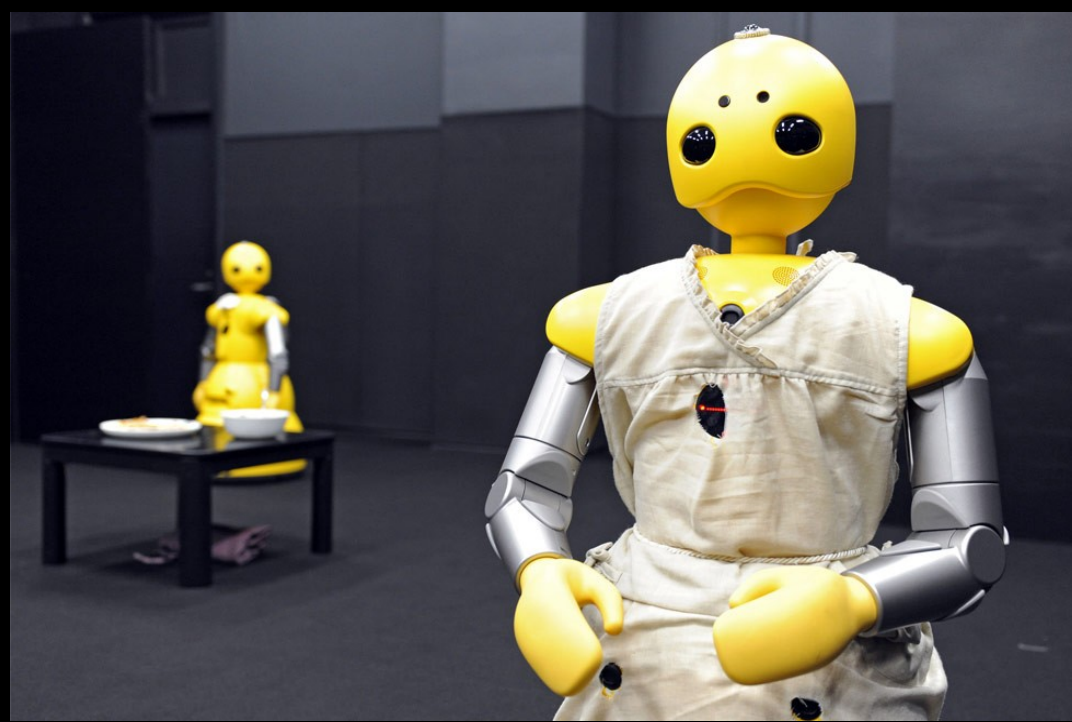


Heddatron
Elizabeth Meriwether
and Alex Timbers
Les Freres Corbusier
2006

Dr. Oddlust
Chris Wilson and
Andrew Byrd
Washington University
in St. Louis
2007



Hataraku Watashi (I, Worker)
Hiroshi Ishiguro
and Oriza Hirata
Osaka University
2008



A Midsummer Night's Dream
Amy Hopper and
Robin Murphy
Texas A&M
2009

Can a human and robot play the same role?



ITM Technology
@ Tokyo Robotics Expo

Movement Pieces





Viewpoints

Putting Theatre Into Robotics



Acting Technique

The Method
Sense Memory

Objective and Action



Marlon Brando

Task Oriented Interaction

User Study with human and robot working together towards a goal

Actor Mimicry via Motion Capture

Evaluations:
speed of task completion
quality of interaction from survey

HRI as Theatre

Exposition / Initiation

Context

Interaction to Achieve Objective

Resolution / Termination

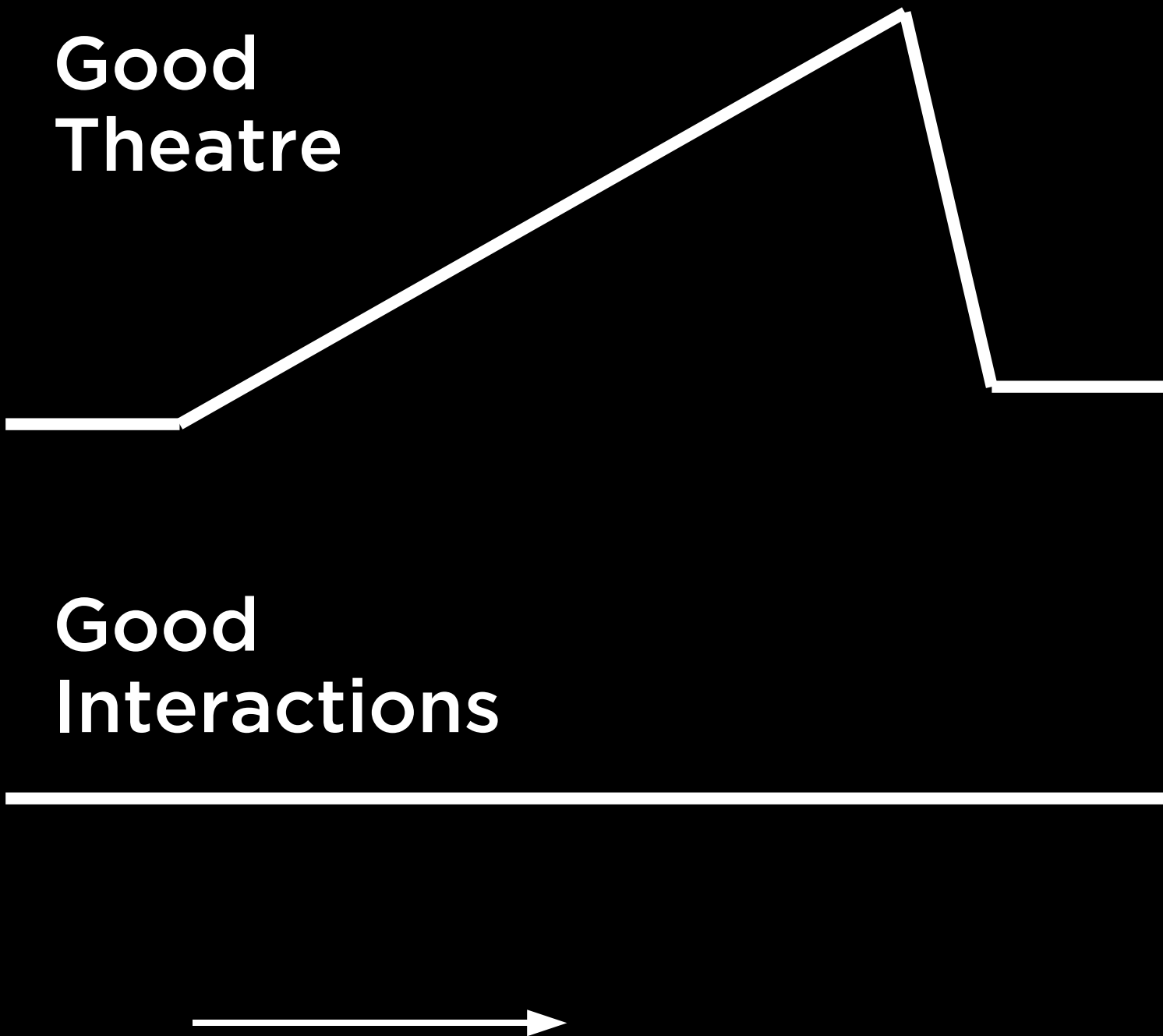
Tension



Good
Theatre

Good
Interactions

Time



The Intersection of Two Worlds

Computer Science

Algorithms

Order

Quantifiable Results

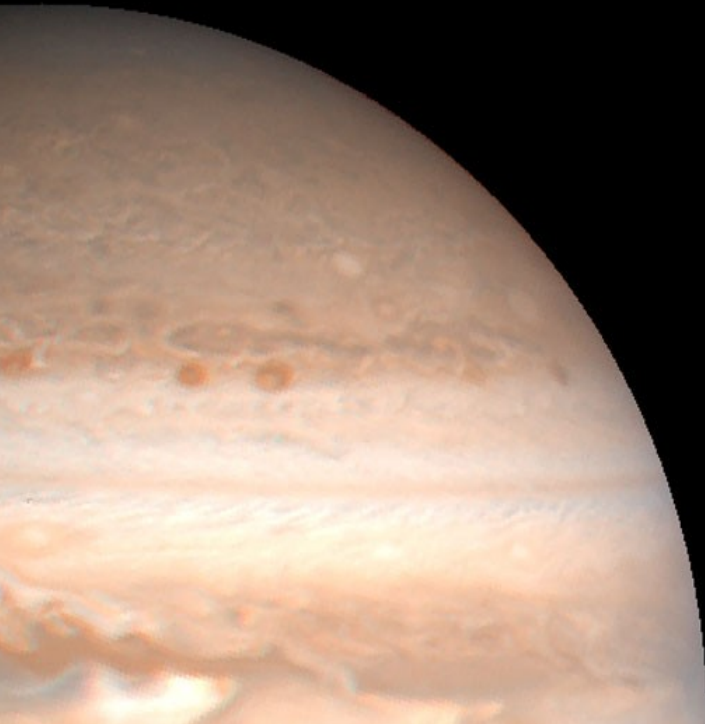
Theatre

Experience

Conflict

Audience Response

Human Robot
Interaction



**"All the world's a stage, and all the
men and women merely players."**

As You Like It
William Shakespeare





Thanks

Organizers of Workshop and
Conference

Anna Pileggi, and our Performing Arts
Collaborators

Bill Smart, Chris Wilson, Dan
Lazewatsky, Erik Karulf, Tom Erez

NSF: IIS 0917199