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University of  
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# MeDiTrain

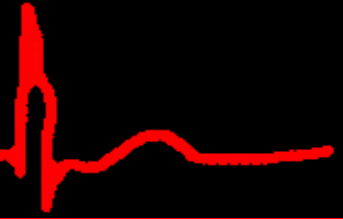
**Using CTAT for Medical Diagnostic Training**

Hannes Olivier –

Technical  
University  
of Clausthal



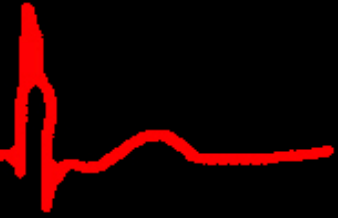
# Problem Statement



- **Can Tutor Systems be Used for Medical Tutoring?**
- **Problems: Medical Diagnostics do not Always Have Exact Answers and a Fixed Working Order**



# First Prototype



**To Test the Basic Ideas a General Example-Tracing Prototype was Developed (using java for convenience)**

Student Interface

Student

ECG

Anamnesis

Pulse Oxymetry

Pulse

Blood Pressure

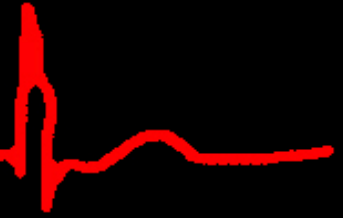
Possible Illnesses

- Cardiac Arrest
- Cardiac Arrytmia
- Angina Pectoris
- Acute Myocardial Infar...
- Gas

Submit



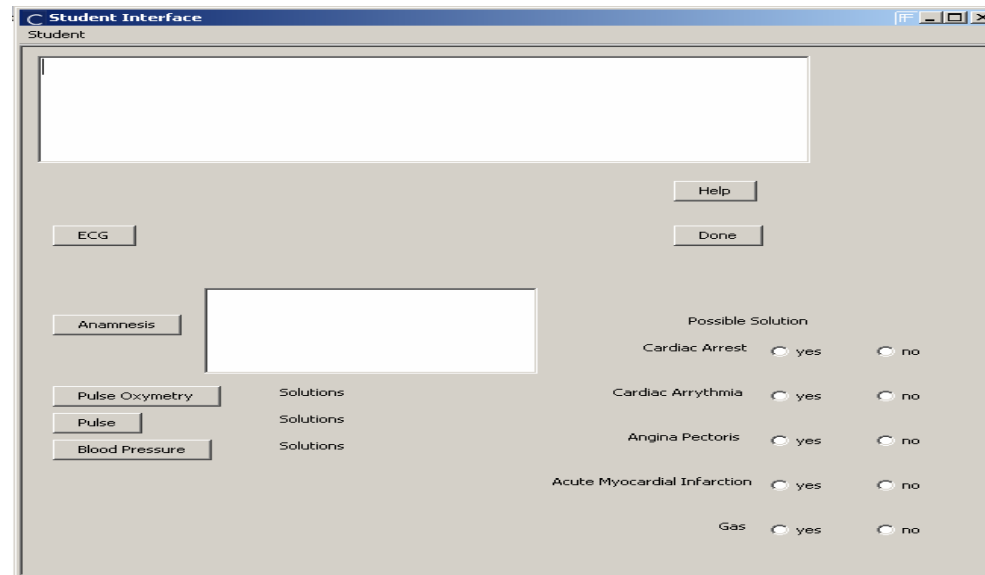
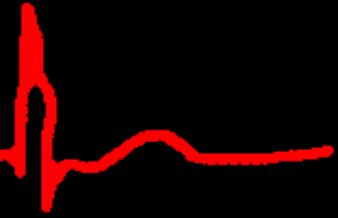
## Problems of the Prototype



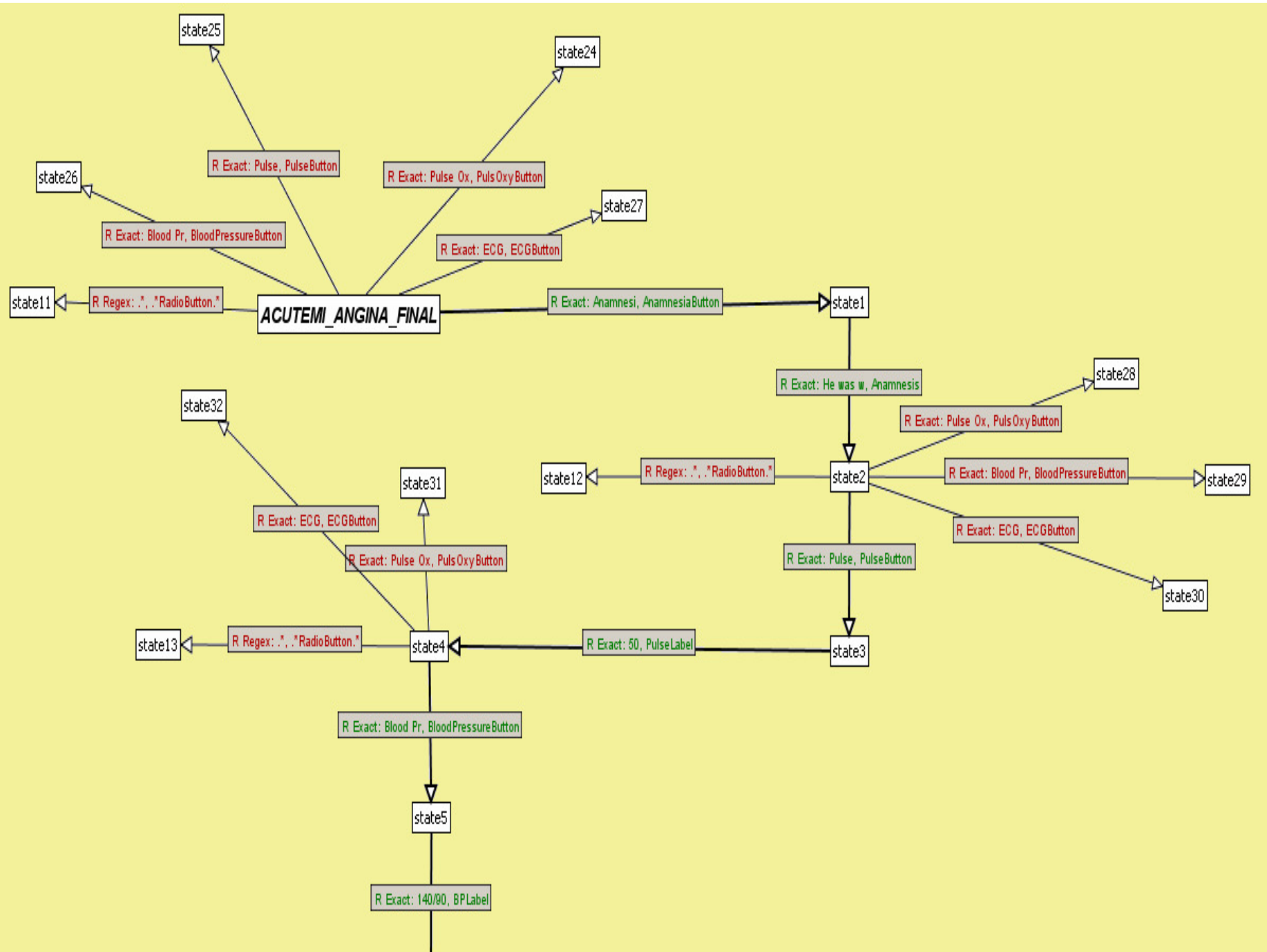
- **Use of Text Lines Instead of Labels**
- **The Hint Section is Far Off the Main Tutor Area**
- **The ComboBox Only Allows Hints for the Whole Solution Set**
- **Pictures were hard coded**
- **No flexibility**

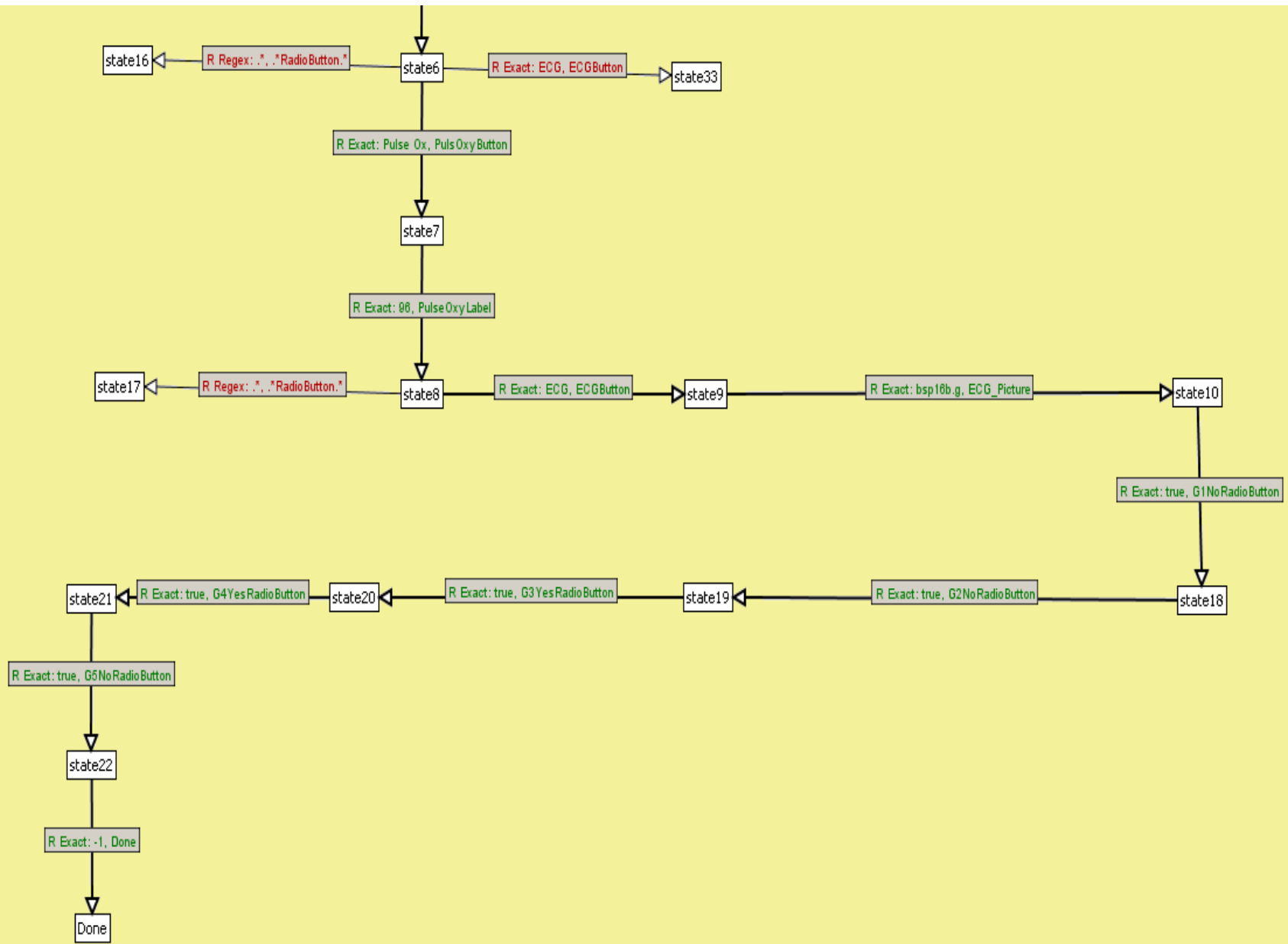


# Second Prototype



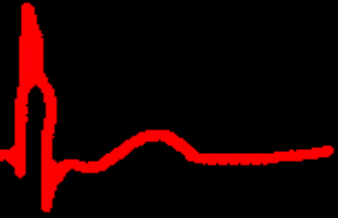
**The Second Prototype was Used to Improve on the Design Weaknesses While Improving the Graph Design**







# Prototype 3



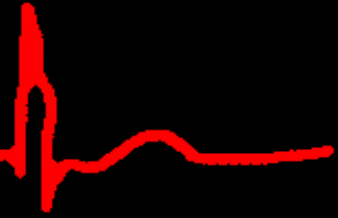
## The Problem and Interface Were Redone for Mass-Production

Problem Name	Angina_Acute_MI
%(Solution_G4_Label)%	Cardiac Arrythmia
%(Solution_G3_Label)%	Cardiac Arrest
%(ProblemStatement)%	Male in the 60s sits with his hand on his chest. His skin is pale and sweaty, he presents signs of pain.
%(Solution_G5_Label)%	Acute Myocardial Infarction
%(Solution_G1_Label)%	Gas
%(Solution_G2_Label)%	Angina Pectoris
%(AnamnesisMessage)%	He was walking up the stairs when he suddenly experienced a strong pain in his chest.
%(PulseMessage)%	50
%(BloodPressureMessage)%	140/90
%(PulsOxyMessage)%	94
%(ECG_Picture_Path)%	bsp16b.gif
%(G1_Yes_No_Button)%	G1NoRadioButton
%(G1_Solution_Hint_2_wrong_values)%	Pulse, pain, sweaty pale skin and ECG are indications
%(G1_Solution_Hint_3)%	Gas does not produce heart problems
%(G2_Yes_No_Button)%	G2YesRadioButton
%(G2_Solution_Hint_2_wrong_values)%	Pulse, pain, sweaty pale skin and ECG are indications
%(G2_Solution_Hint_3)%	The ST-Segment directs us towards an Angina or an Myocardial Infarction. Further tests are needed to further diversify.
%(G3_Yes_No_Button)%	G3NoRadioButton
%(G3_Solution_Hint_2_wrong_values)%	Pulse, pain, sweaty pale skin and ECG are indications
%(G3_Solution_Hint_3)%	The heart is still running. So it cannot have stopped.
%(G4_Yes_No_Button)%	G4NoRadioButton
%(G4_Solution_Hint_2_wrong_values)%	Pulse, pain, sweaty pale skin and ECG are indications
%(G4_Solution_Hint_3)%	There are no signs of arrythmia.
%(G5_Yes_No_Button)%	G5YesRadioButton
%(G5_Solution_Hint_2_wrong_values)%	Pulse, pain, sweaty pale skin and ECG are indications
%(G5_Solution_Hint_3)%	The ST-Segment directs us towards an Angina or an Myocardial Infarction. Further tests are needed to further diversify.





# Prototype 4



## Flash Interface with Movie Clips

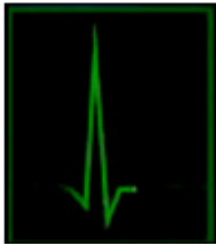
Connected - ArtiorTime - v.2.4.63

**MeDiTrain Tutor** Hint

**Scenario 1** Male in the 60s sits with his hand on his chest, sweating. His skin is pale and the presents signs of pain.

**Test Options**

- ECG
- Anamnesis
- Pulse
- Blood Pressure
- Pulse Oxymetry
- Done



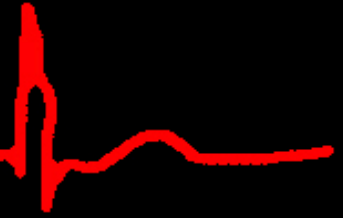
**Possible Symptoms**

- Cardiac Arrhythmia
- Cardiac Arrest
- Acute Myocardial Infarction
- Angina Pectoris
- "Gas"

Help



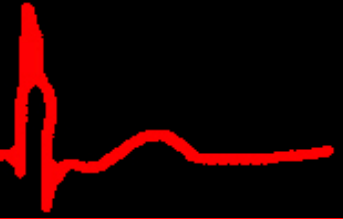
## Problems to be solved in future Java Versions



- **The Option of Check Boxes Which are not Grouped. This Way Individual Solutions can be Done Without Referring to the More Spacious Radio Buttons.**
- **More flexible Graph development (optional steps)**



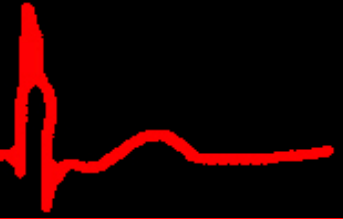
# The future calls... Improvements



- **Collaboration: EMTs work in teams, so a synchronized system with interaction supervised by a tutor would be interesting.**
- **Including the tutor not in a 2d but a 3d environment (for example Project Wonderland)**



## The future calls... Improvements



- **Putting a time value on the tests. The diagnostic has to be found as time-efficient as possible. Not all tests have to be taken.**
- **Diverging the topic to cell biology for student testing in lab environments.**
- **Changing to Cognitive Tutors**