

Data to text

DATA TO TEXT

(Reiter and the Aberdeen team)

Motivation

Overcoming the information overload in decision-making

Highlighting relevant constellations (up to user interpretation in visual contexts)

For environments where extensive datasets are collected (semi-)automatically

Methods applied

Analysing data (time series) for characteristic patterns

Summarizing essential/salient observations

Application areas

Weather prediction models

Technical equipment (e.g., sensors connected to gas turbines)

Medical situations (e.g., project "BabyTalk")

CHALLENGES

The nature of reports

Descriptive summaries rather than recommendations

Domain experts / doctors mostly resistant to automatic recommendation

Technical challenges

Handling data in various formats, integrating their interpretation

Handling adequately the sheer quantity of data

Selecting and structuring the content

Following story schemes, building a kind of story line

Much of the data is temporally organized

Present a coherent narrative (requires after-thought by humans)

AUTOMATICALLY GENERATED TEXT

You saw the baby between 16:40 and 17:25. Heart Rate(HR)=155. Core Temperature(T1) = 36.9. Peripheral Temperature(T2) = 36.6. Transcutaneous Oxygen(TcPO2) = 9.0. Transcutaneous CO2(TcPCO2) = 7.4. Oxygen Saturation(SaO2) = 94.

Over the next 24 minutes there were a number of successive desaturations down to 0. Fraction of Inspired Oxygen(FIO2) was raised to 100%. There were 3 successive bradycardias down to 69. Neopuff ventilation was given to the baby a number of times. The baby was re-intubated successfully. The baby was resuscitated. The baby had bruised skin.

Blood gas results received at 16:45 showed that PH=7.3, PO2=5, PCO2=6.9 and BE=-0.7.

At 17:15 FIO2 was lowered to 33%. TcPO2 had rapidly decreased to 8.8. Previously T1 had rapidly increased to 35.0.

A COMPARISON

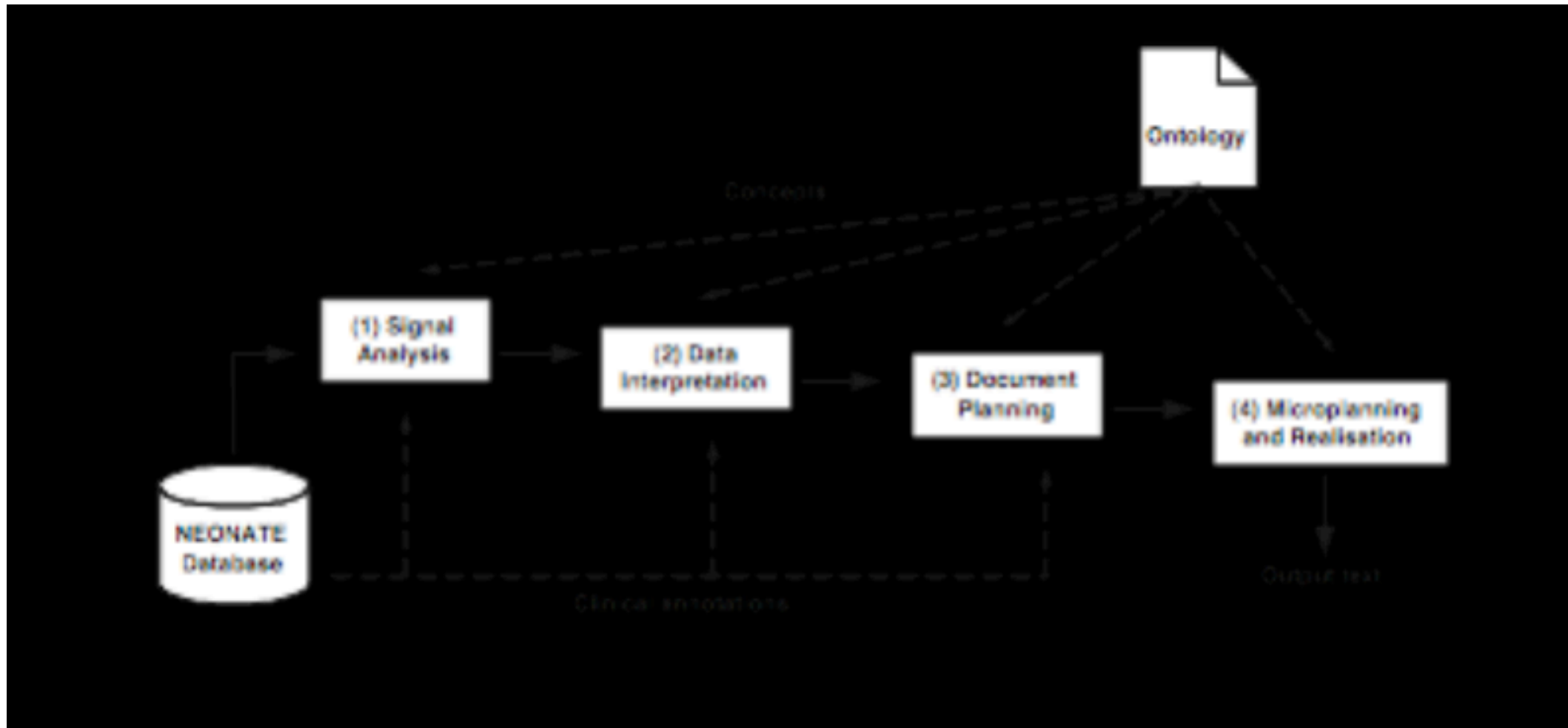
Shift 23 written by Human Nurse

1 EVENTS THIS SHIFT
2 On admission he was in air.
3 Within an hour his respiratory rate was 63
4 with moderate recession, nasal flaring,
5 occasional grunting and SpO2 falling to
6 the low 80s. He was placed prone and put
7 into 24% incubator oxygen.
8 At 5 hours of age he was in 45% incubator
9 oxygen, and was electively intubated
10 (morphine and sux were given) and put
11 onto CMV ventilation: rate 50, pressures
12 19 / 5, iTime 0.3 in 30% oxygen, tidal
13 volumes were 5ml. ETT is size 3, and 8cm
14 at the lips.
15 At 16:20 (6 hours of age) surfactant was
16 given, 240 mg, first dose, and he was in air
17 within an hour after that.
18 Ventilation has been weaned with CBGs to
19 the present settings.
20 Recession is now just mild. Breathing has
21 settled and he is taking spontaneous
22 breaths.

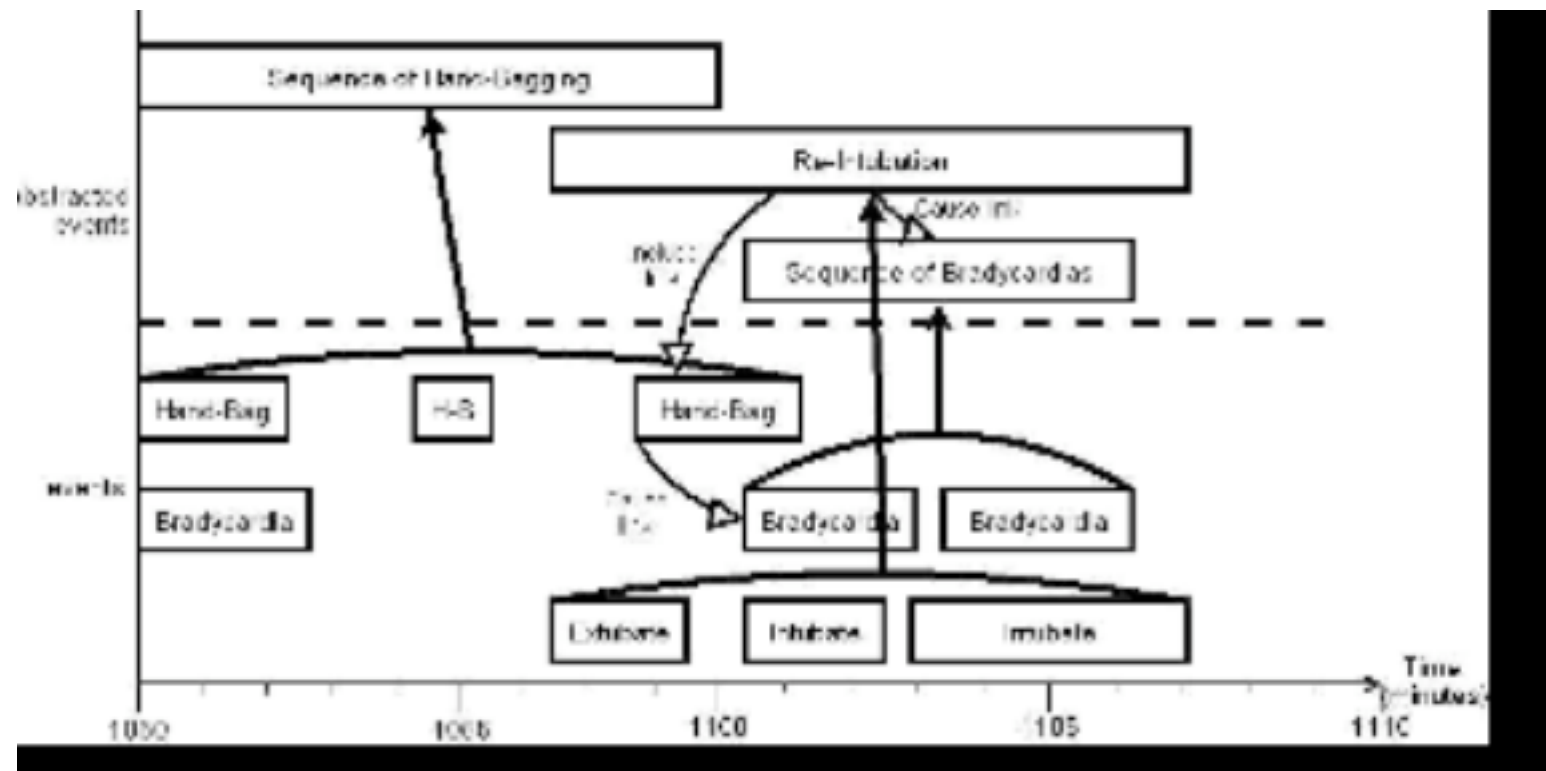
Shift 23 generated by BT-Nurse

1 Events During the Shift
2 Between 11:30 and 14:30, SaO2 decreased
3 from 93 % to 84 %.
4 A CBG was taken at 12:15. Parameters
5 were acceptable pH was 7.37. CO2 was
6 7.02 kPa. Be was -1.9 mmol/L.
7 The baby was intubated at around 15:15
8 and was moved from Inc O2 to CMV. Vent
9 RR was 50 breaths per minute. Pressures
10 were 19/5 cms H2O. He was in air. Tidal
11 volume was 8.9.
12 At around 15:15, he was given morphine.
13 At about 15:15, he was given
14 suxamethonium.
15 At around 18:30, he was given a first dose
16 of 240 mg of surfactant.

DATA INTERPRETATION AND PRESENTATION



CONCEPT FORMATION AND ABSTRACTION



SOME TRENDS

Generating referring expressions

corpus studies, learning preferences, visual context

Tools

Corpus building, grammar writing

Summarization

Knowledge-based improvements, featuring conceptualizations

Explanation

In ontology contexts

Shared tasks

GRE, surface realization, text generated from knowledge bases, variations

Evaluation methods