Medical Diagnosis

Complex AI Systems

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Medical Diagnosis Agents can be built using **Supervised Learning** methods.

Colon Cancer Data

- Each row represents one patient, described by 2000 genetic attributes.
- Class label = -1 (no cancer), or 1 (cancer)

1	-1.000000 1:-0.676530 2:1.693100 3:1.559250 4:1.559980 5:-0.982179 6:-1.358510 7:-1.313990 8:-0.455067
2	1.000000 1:-1.185370 2:-0.514473 3:-0.566634 4:1.224720 5:0.619244 6:-0.684713 7:-0.798129 8:1.368770 ⑨
3	-1.000000 1:1.779050 2:0.423947 3:0.820696 4:2.525690 5:0.666921 6:0.661346 7:0.425365 8:0.165247 9:1.
4	1.000000 1:-0.889638 2:-0.315453 3:-0.073131 4:1.157500 5:-0.311039 6:-0.364472 7:-1.621640 8:1.193000
5	-1.000000 1:1.605150 2:-0.771553 3:-0.819771 4:0.292317 5:1.648190 6:0.192798 7:1.348880 8:1.284650 9:
6	1.000000 1:0.867577 2:0.501470 3:0.242006 4:0.417230 5:1.723880 6:-1.249270 7:-0.815193 8:2.015220 9:1
7	-1.000000 1:0.590751 2:0.440645 3:0.585110 4:1.470660 5:0.724532 6:-1.874140 7:-2.038920 8:1.115610 9:
8	-1.000000 1:0.369171 2:0.742324 3:0.584255 4:0.617444 5:-1.513950 6:1.180220 7:-0.268009 8:0.513435 9:
9	-1.000000 1:0.261661 2:-0.126443 3:0.084908 4:-0.461416 5:0.420518 6:0.386768 7:0.257387 8:1.184280 9:
10	-1.000000 1:1.440710 2:0.649996 3:0.873454 4:0.190425 5:-0.368266 6:1.162670 7:1.748130 8:-0.859296 9:

Colon Cancer Data

- We can build a diagnostic model to predict patient state given their genetic data.

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Medical Diagnosis Agents can be built using Knowledge Representation and Reasoning methods.

Cold, Flu, COVID Diagnosis

- **A patient consults a doctor to see if the symptoms they have are due to a common cold, flu, or covid.**

Cold, Flu, COVID Diagnosis

- **We can encode a doctor's knowledge in a KB using propositional or first-order logic.**

- **Apply inference methods to infer diagnosis**

Source: https://www.lrsd.org/Page/5650

Cold, Flu, COVID Diagnosis

- **Supervised learning can also be used to build a DT to diagnose based on given symptoms.**

Flu, Cold, Allergies, or Covid-19?

Do you have a fever?

Yes

Are you experiencing shortness of breath?

Yes — No

You MAY have Covid-19
Other symptoms
Cough
Fatigue
Weakness
Exhaustion

You MAY have the flu
Other symptoms
Cough
Fatigue
Weakness
Exhaustion

No

Do you have itchy eyes?

Yes — No

You MAY have allergies
Other symptoms
Sneezing
Runny nose

You MAY have the common cold
Other symptoms
Sneezing
Runny nose
Mild chest discomfort

These are common symptoms which may vary from person to person.
A Healthy Connections provider can give you a diagnosis.

888-710-8220

www.healthy-connections.org