# STAT 539 Graph tricks with Pstricks

## . . . and a word about Beamer

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# What is Pstricks?

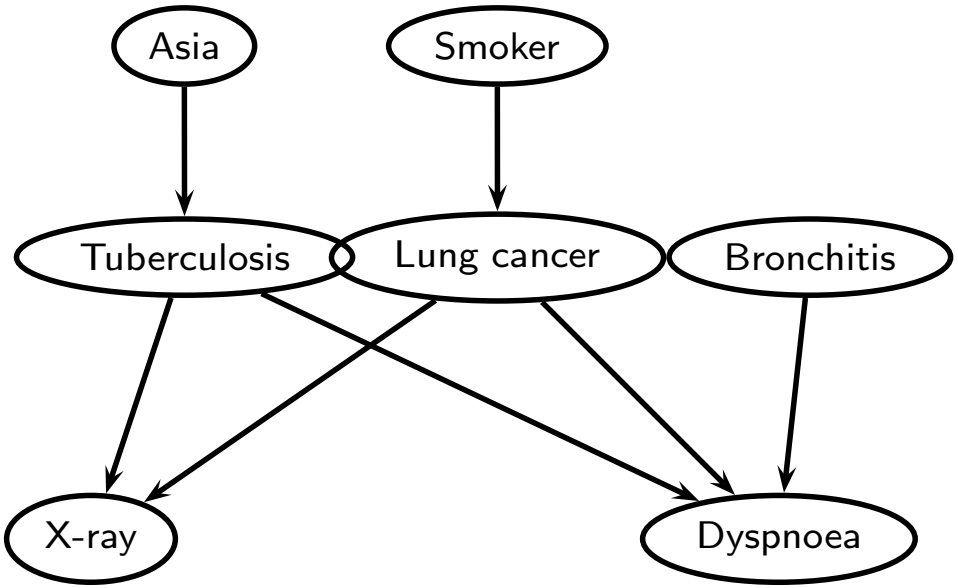
- pstricks is a very powerful, versatile package for including graphics in LaTeXdocuments
- usage `\usepackage{pstricks}` or `\usepackage{pstcol,pst-node}` (color, matrices only)[1]

- Drawback: you must provide absolute coordinates
- Remedy: the package `pst-rel-points` lets you provide relative coordinates

- The part that I found more useful is `pst-node` the matrix drawing package
  - simple syntax
  - aligns "nodes" in rows and columns automatically (no need to calculate coordinates)
  - with connectors and node labels you can draw many useful "pictures" easily

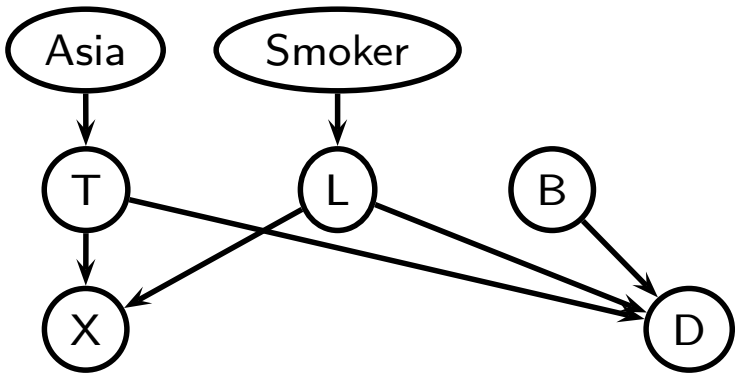
[1] I'll return to matrices in a few slides

# Example - a DAG drawn with pspicture




```
\psset{xunit=.7cm,yunit=.4cm,linewidth=
\begin{pspicture}(-1,-2)(21,14)
\rput(1.5,1){\ovalnode{X}{X-ray}}
\rput(12.5,1){\ovalnode{D}{Dyspnoea}}
\rput(3,7){\ovalnode{T}{Tuberculosis}}
\rput(8,7){\ovalnode{L}{Lung cancer}}
\rput(13,7){\ovalnode{B}{Bronchitis}}
\rput(3,11.5){\ovalnode{A}{Asia}}
\rput(8,11.5){\ovalnode{S}{Smoker}}
\ncline{->}{A}{T}
\ncline{->}{S}{L}
\ncline{->}{T}{X}
\ncline{->}{L}{X}
\ncline{->}{T}{D}
\ncline{->}{L}{D}
\ncline{->}{B}{D}
\end{pspicture}
```

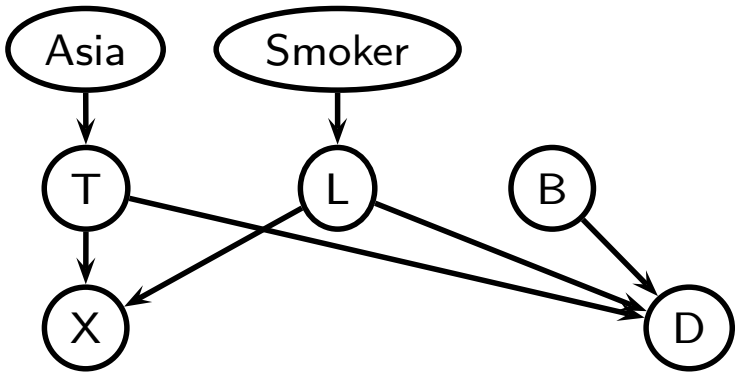
# Same DAG drawn with pst-node




```
\psset{linewidth=1pt,arcangle=-30}
\begin{psmatrix}[mnode=oval,colsep=.3cm,
                                 rowsep=.3cm]
[name=A]Asia & [name=S]Smoker\\
[name=T]T & [name=L]L & [name=B]B
[name=X]X&&&[name=D]D
\ncline{->}{A}{T}
\ncline{->}{S}{L}
\ncline{->}{T}{X}
\ncline{->}{L}{X}
\ncline{->}{T}{D}
\ncline{->}{L}{D}
\ncline{->}{B}{D}
\end{psmatrix}
```

- alignment is done automatically
- using the optional node labels allows for moving the nodes around

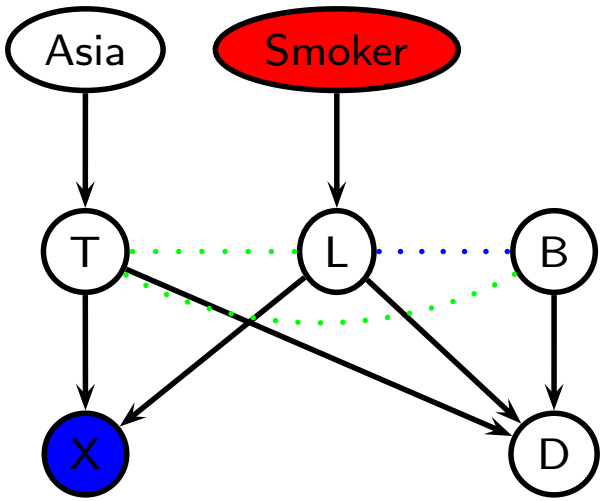
# Same DAG drawn with pst-node, no node labels




```
\psset{linewidth=1pt,arcangle=-30}
\begin{psmatrix}[mnode=oval,colsep=.3cm,
                                rowsep=.3cm]
Asia & Smoker\\
T & L & B
X&&&D
\ncline{->}{1,1}{2,1}
\ncline{->}{1,2}{2,2}
\ncline{->}{2,2}{3,1}
\ncline{->}{2,1}{3,4}
\ncline{->}{2,2}{3,4}
\ncline{->}{2,3}{3,4}
\end{psmatrix}
```

- with no node labels, one needs to provide absolute matrix coordinates

# Adding colors, changing line styles, arcs




```
\psset{linewidth=1pt,arcangle=-30}
\begin{psmatrix}[mnode=oval,colsep=.3cm,
                                rowsep=.7cm]
[name=A]Asia & [name=S,fillstyle=solid,fillcolor=red]Smoker\\
[name=T]T & [name=L]L & [name=B]B\\
[name=X,fillcolor=blue,fillstyle=solid]X&&[name=D]D
\ncline{->}{A}{T}
\ncline{->}{S}{L}
\ncline{->}{T}{X}
\ncline{->}{L}{X}
\ncline{->}{T}{D}
\ncline{->}{L}{D}
\ncline{->}{B}{D}
\psset{linestyle=dotted,linecolor=green}
\ncline{-}{T}{L}
\ncline[linecolor=blue]{-}{B}{L}
\ncarc{-}{T}{B}
\end{psmatrix}
```

# Why Beamer? (or why not?)

Why use `Beamer` to make slides?

- looks professional
- makes reusable slides/notes/handouts/papers
- allows the usage of other latex tools
  - `toc`
  - `index`
  - `bib` files
- powerful
  - overlays
  - hyperlinks
  - multimedia (?)

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Why NOT use `Beamer`?

- making talks is **SLOW**