Aalto University

AutoCAD – lecture 1

20.9.2021

Motivation

- **Why learn AutoCAD?**

  - Widely used software all around the world

  - Valuable entry in your CV, many people have gotten summer jobs in the field with course

  - Useful tool in the courses and projects to come

  - Useful tool in working life

AutoCAD Module

- **Consists of lectures, exercises, and assignments**
  - Two assignments: site plan and cross section of a hall
- **Both assignments must be passed**
- **All needed materials can be found from MyCourses**
- **Help is available on exercise sessions and on the MyCourses forum**
- **Assistants:**

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Assignment 1: Site Plan

- **Step by step guide available on MyCourses**
- **Goes through the basic commands**
- **Returned during week 2 of the course (Sunday 26th of Sept)**

Need Help?

- **Exercise sessions**
- **Instruction material on MyCourses**
- **Forum on MyCourses**
- **Internet – Google is your buddy!**
  - Autodesk Knowledge Network: https://knowledge.autodesk.com/support/autocad

What is AutoCAD?

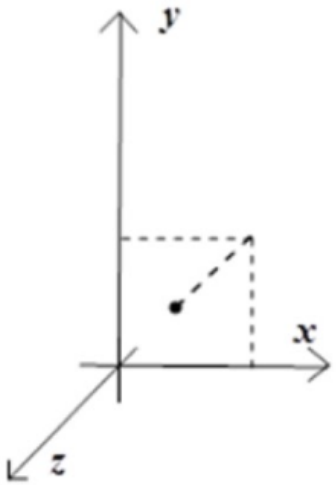
- CAD = **C**omputer **A**ided **D**esign
- AutoCAD is:
  - Computer aided design software
  - Technical drawing software
- Standard guidelines for the design industry
- Versions for many different fields
- Mostly used to draw 2D drawings, but also includes 3D features

Features and Advantages of AutoCAD

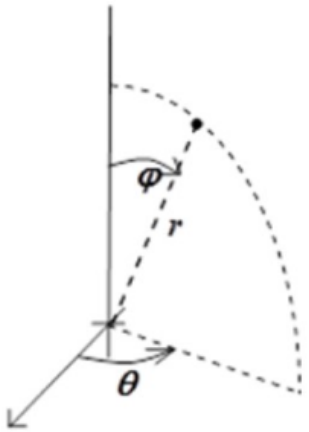
- AutoCAD's file formats are widely compatible
  - DWG (.dwg), drawing
  - DXF (.dxf), data exhange file
- Suitable for design tasks for many different fields
- Complete libaries and expansions packages
  - University uses RAK library, includes commands and among other things

Coordinate Systems

- There are three different kinds of coordinate systems in AutoCAD
  - Absolute cartesian coordinates
    - X,Y(,Z), e.g. 10,5
  - Relative *cartesian coordinates*
    - @X,Y(,Z), e.g. @5,3
  - Relative polar coordinates
    - @r<a, e.g. @10<45



Cartesian



Polar

Geometries

- Possible objects are:
  - 0D model: point
  - 1D model: point and line
  - 2D model: point, line, and plane
  - 3D model: point, line, plane, and volume

- The points determine the geometry
  - Two points determine a line
  - Three points determine a plane
  - Lines determine a plane
  - Planes determine a volume

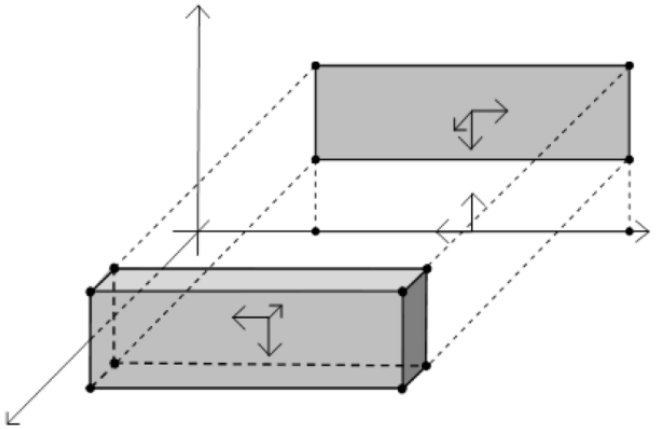


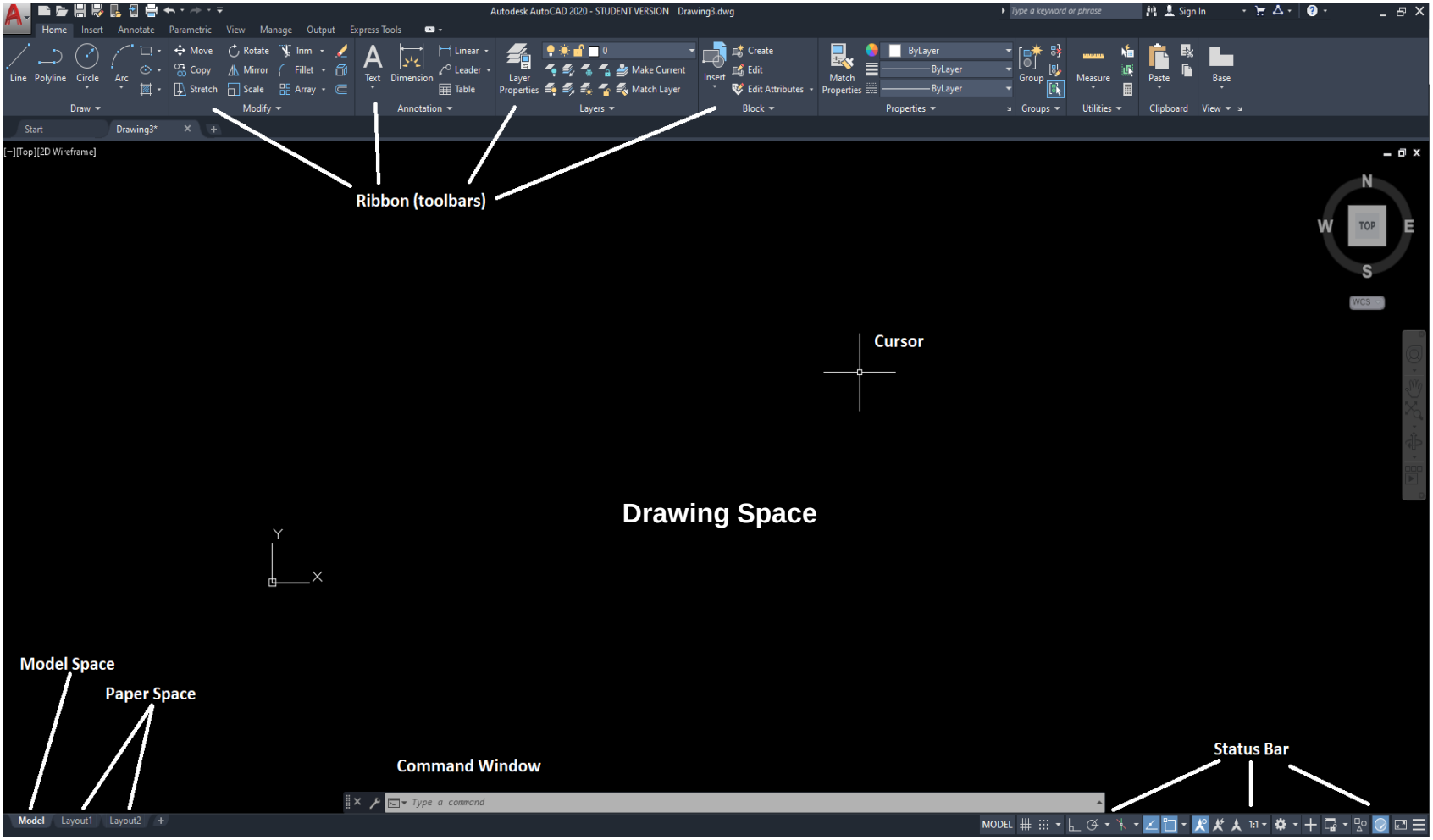
Figure: Each object has their own local coordinate system

Using AutoCAD

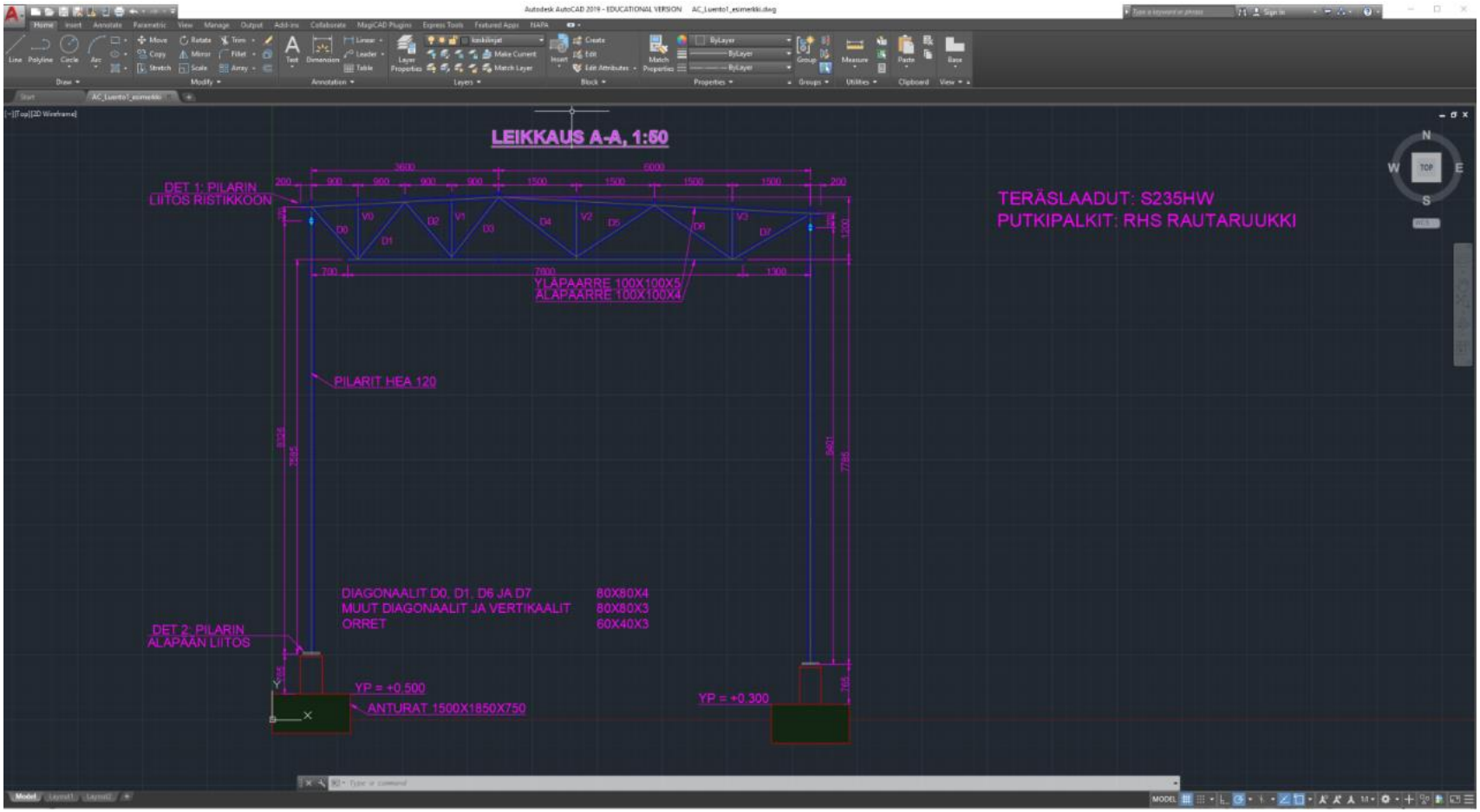
- AutoCAD has two spaces:
  - Drawing is made in Model Space
  - Printout layout and scaling is done in Paper Space

- Commands can be given three ways:
  - Command line (https://www.autodesk.com/shortcuts/autocad)
  - Dropdown menus / ribbon menu
  - Point and click with cursor

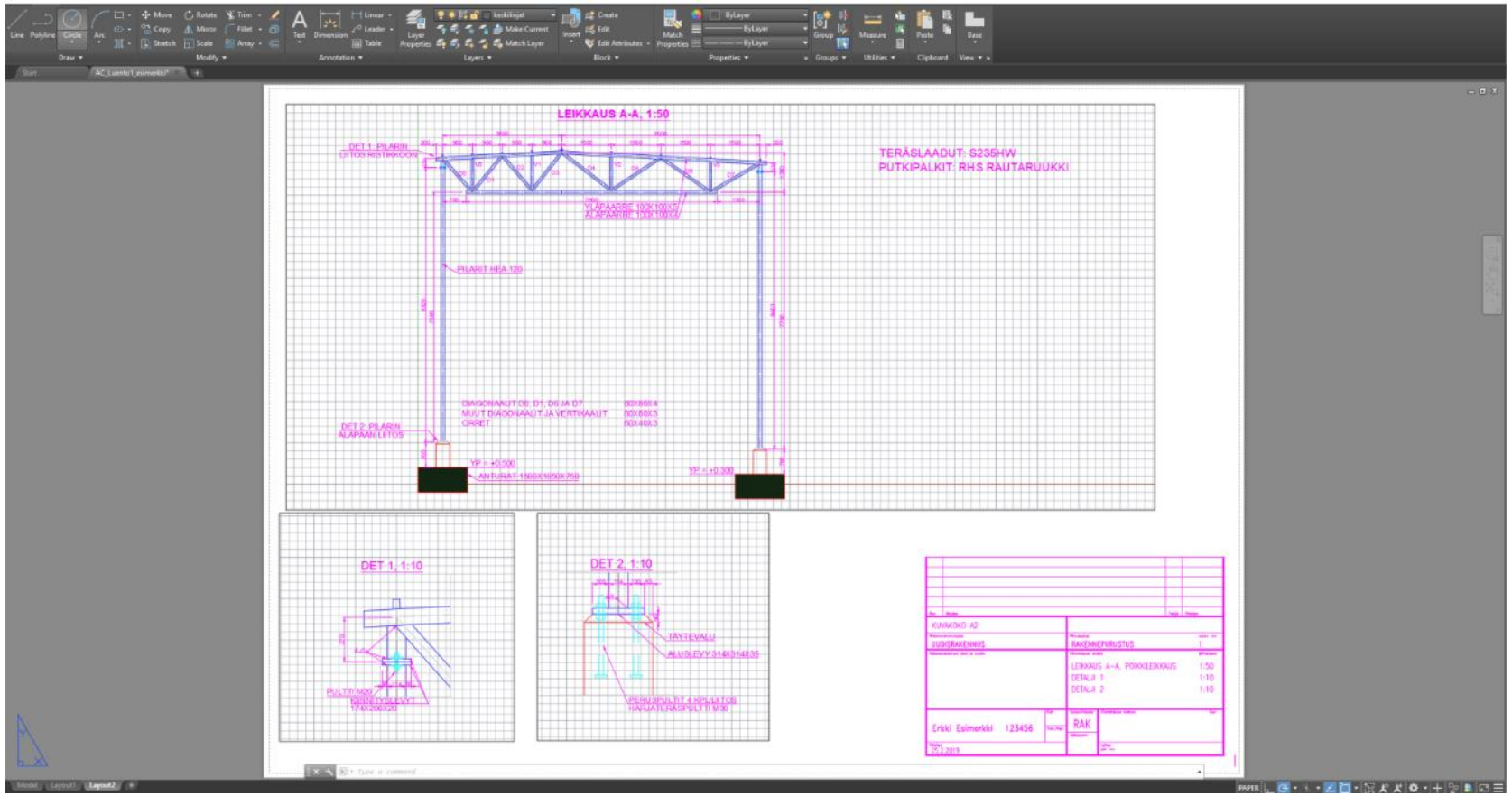
User Interface



Model Space


LEIKKAUS A-A, 1:50
DET 1: PILARIN
LIITOS RISTIKKOON
TERÄSLAADUT: S235HW
PUTKIPALKIT: RHS RAUTARUUKKI
YLÄPAARRE 100X100X5
ALAPAARRE 100X100X4
PILARIT HEA 120
DIAGONAALIT D0, D1, D6 JA D7 80X80X4
MUUT DIAGONAALIT JA VERTIKAALIT 80X80X3
ORRET 60X40X3
DET 2: PILARIN
ALAPÄÄN LIITOS
YP = +0.500
ANTURAT 1500X1850X750
YP = +0.300

Paper Space


LEIKKAUS A-A, 1:50
TERÄSLAADUT: S235HW
PUTKIPALKIT: RHS RAUTARUUKKI
DET 1, 1:10
DET 2, 1:10

Availability of AutoCAD

- AutoCAD is installed on some of the computer classes in our university
- Student license for your own computer is available at: https://www.autodesk.com/education/free-software/autocad
- Note! Mac version of AutoCAD is not identical to Windows version, so it is not advised to use it on this course

Thank you!

Questions, comments?