How to choose machine vision lens

1. To find out what kind of mount for your lens, C, CS or board, etc. It depends on the camera that a lens works with. Check your camera first.

2. It is important to understand the angle of the lens. The angle of view depends on the focal.

- The larger the number focal, the narrower the angle of view.
- The sensor of camera (h×v):
  - 1” sensor: 9.6mmx12.8mm
  - 2/3” sensor: 6.6mmx8.8mm
  - 1/2” sensor: 4.8mm X 6.4mm
  - 1/3” sensor: 3.6mm x 4.8mm
  - ¼” sensor: 2.7mm x 3.6mm
- The formula:
  - F = v X D /V or f = h X D /H
  - f: the length of focal
  - H: the height of the object
  - V: the width of the object
  - D: the distance between the camera and the object
  - h: the height of the sensor in camera
  - v: the width of the sensor in camera

Example 1, you want to watch an object 8ft wide (V) at 10 ft(D) with 1/3" camera (v=4.8mm). You need a 6mm focal lens (4.8x10/8).
Example 2, you want to watch an object 8ft wide (V) at 165 ft(D) with 1/3" camera (v=4.8mm). You need a 100mm focal lens (4.8x165/8). That means the object is displayed by full screen on your VGA monitor. If you do not know where you like to see, you can choose a varifocal lens, for example, 5-100mm, 6-60mm, 3.5-8mm, or 2.8-12mm,
5.5-33mm lens, etc. so that you can adjust the focal to find the best view.

3. A 1" lens can work with a 1", 2/3", 1/2", 1/3" or 1/4" camera. A 2/3" lens can work with a 2/3", 1/2", 1/3" or 1/4" camera. A 1/2" lens can work with a 1/2", 1/3" or 1/4" camera. A 1/3" lens can work with a 1/3" or 1/4" camera. A 1/4" lens only can work with a 1/4" camera.

4. If you need adjust the view of angle, you need choose a vari-focal lens. Otherwise, you can choose a fixed lens to save money.

5. If the light condition changes, you will need an auto-iris lens or a manual-iris lens. An auto-iris lens can be adjusted iris by a camera. A manual-iris lens can be adjusted iris by hand.
For example, if you got an outdoor camera, an auto-iris lens may be what you

need. There are DC drives and video drive for auto–iris lenses. Most cameras can support both drive types. It can be selected by a switch on the camera.

6. If you like to see image when IR LED turn on, an IR lens would work better.

7. If you like to see from a small hole, you can choose a pinhole lens.

8. If you have a CS mount camera and a C mount lens, you need to place a 5mm adapter between the lens and the camera. Otherwise, it will not work.

9. Extension tubes allow you to turn standard fixed focal length lenses into macro lenses. An extension tube kit is available which includes 7 extender tubes: 0.5 mm, 1 mm,2 mm, 5 mm, 10 mm, 20 mm and 40 mm for extension from 0.5 mm to 78.5 mm. The tube(s) mount between the camera and the lens, making it possible for you to focus a C or CS mount lens at a much closer distance than normal.

10. There is a ring in front of most cameras so that you can adjust distance between the lens and camera chip if you need.