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Skill set required for Bin Picking

1. Majority of Bin Picking applications developed on “green field”

1. Wide skill set required

1. Specific to robotic brand

- CAD
- Robot programming
- Software engineering
- Mathematics
- Geometry
- Linux
- Robot Kinematics
- 3D vision
- Localisation
What can be replaced and represented by CAD model?

- Robot
- Part
- Tool
- Object
- Environment
- Bin
Designed for robotic integrators

**Real-time robot control**
- Precise knowledge of the manipulator position at any point in time
- Safety functions are bypassed
- New approach requires major re-skilling of the integrators

**Trajectories calculated in advance**
- Program flow fully in the hands of robotic programmer
- Offline calculation of the trajectories
- All safety functions remain active
- Robot controller acts as a master
Sustainability of Bin Picking Studio

Transforming experience and knowledge from projects delivered by Photoneo into a product which enables our partners to deploy robust and reliable Bin Picking applications.
Benefits of CAD modeling

Collision avoidance

Every move of the robot is unique
  • Each part has a unique position

Possible collisions
  • Environment
  • Remaining parts in the bin
  • Robot with itself
  • Gripped part with the environment
Benefits of CAD modeling

- Symmetries
- Use a property of the object as advantage
- Cover the object with gripping points
- Determine a right balance of possible gripping points and performance
Challenges

- Localisation of the bin
- Multiple bins
- Shiny or transparent objects
- Cycle time
Challenges

- Debugging and “baby sitting”
- Multiple parts
- Conveyor belts
- Flexible production
- Production downtime
Future

- CAD based localisation
- Any Pick
- Artificial Intelligence /Machine learning
- 3rd party algorithms
Future

- Mobile Bin Picking
- Welding
- Assembly
- Robot observing and understanding the environment
Thank you for your attention