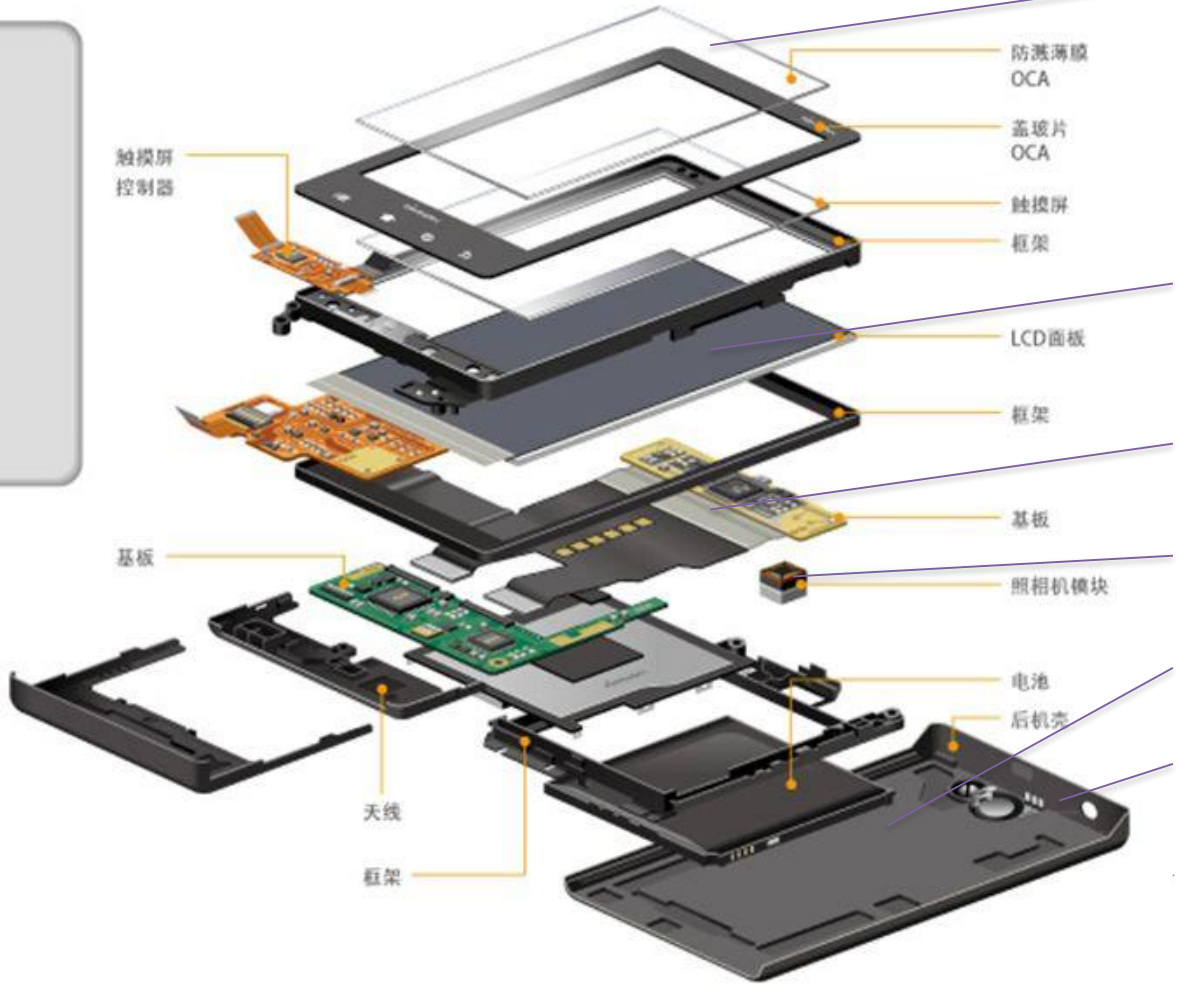
# Marvie 系列机器人控制器在3C行业应用解决方案

固高科技（深圳）有限公司
机器人事业部




玻璃加工

液晶屏生产

PCB生产，检测

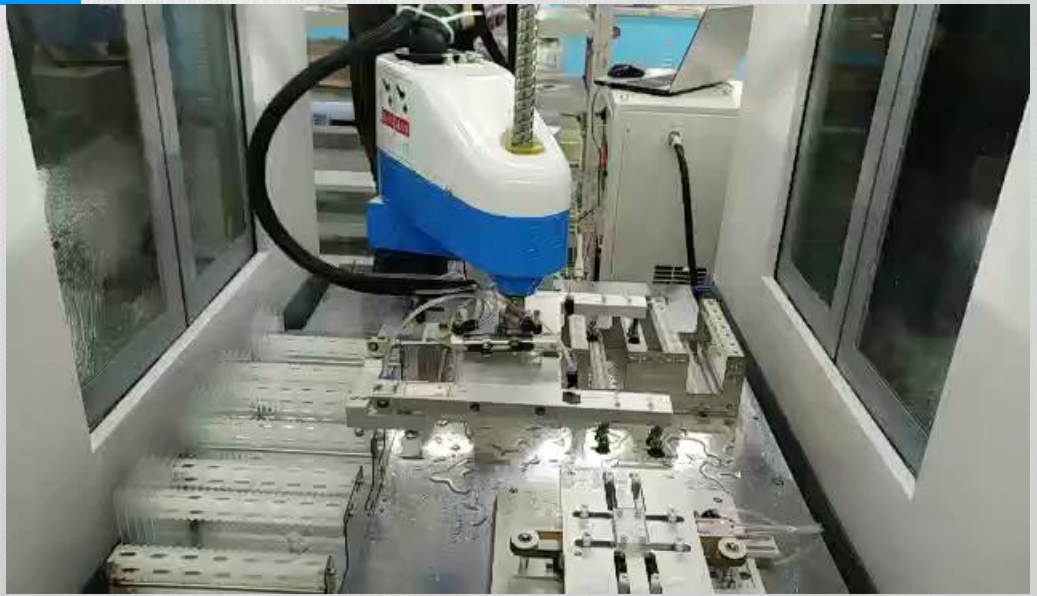
镜头检测

手机外壳加工

手机壳条码贴标

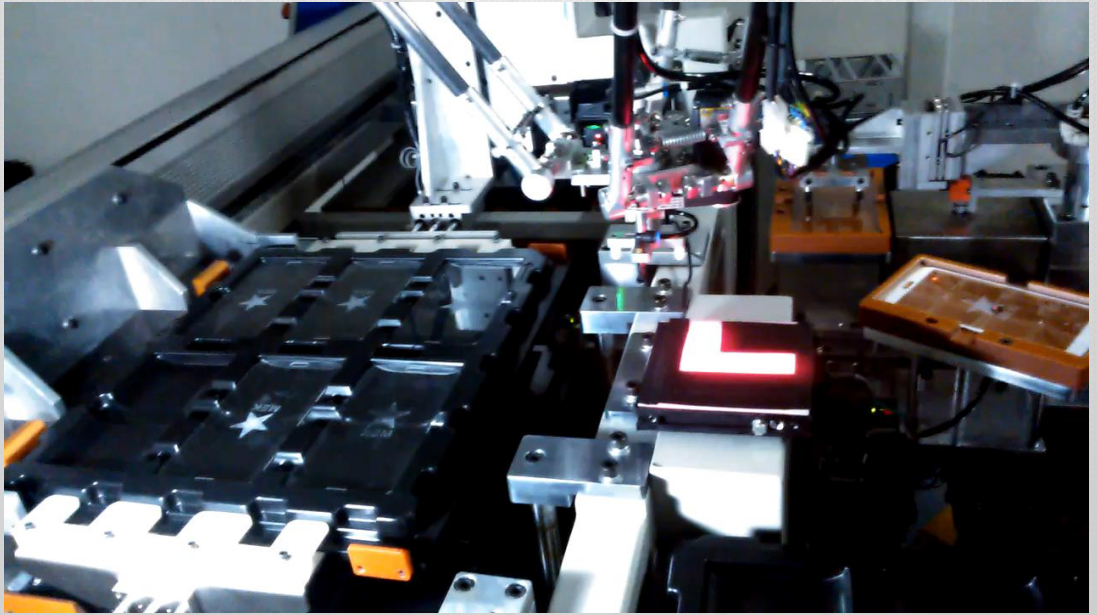
整机检测

# 玻璃加工



QKM SCARA 机器人在玻璃自动化加工生产线上的应用。
解决方案： Marvie 4 + 专用CNC控制系统

# 玻璃检测



Delta机器人在手机玻璃自动检测过程中的应用。
解决方案：Marvie 4 + Delta Robot

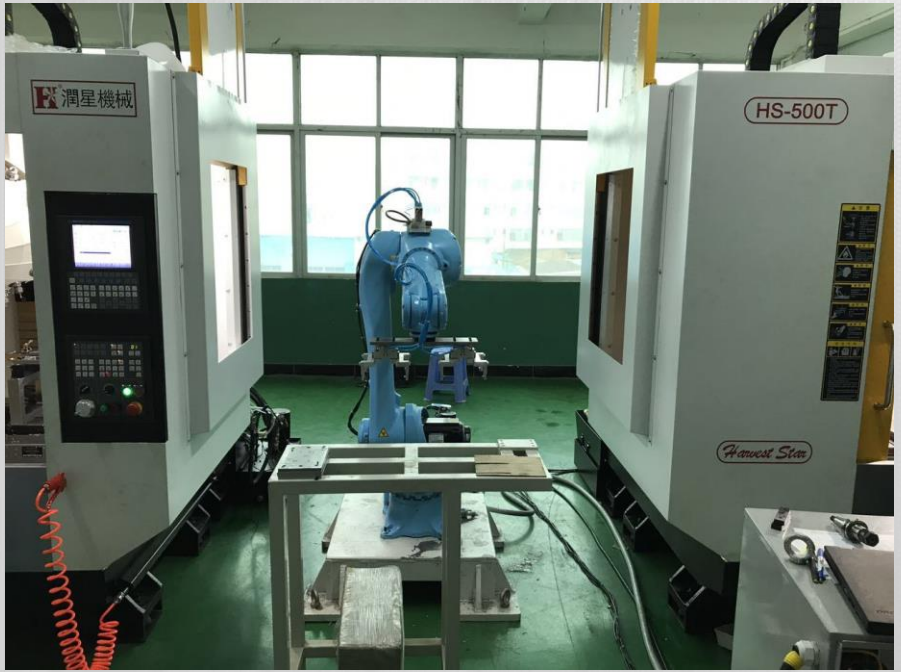
# PCB生产、检测

笔记本电脑主板PCB检测自动上下料。

解决方案：Marvie 6 + Articulated Manipulator。

手机行业一般以SCARA机器人居多——TCL手机PT产线。

# 手机外壳加工




手机外壳加工自动化上下料。
解决方案：Marvie 6 + Articulated Manipulator。

# 手机模具锁/拆螺钉

手机模自动锁螺钉、拆螺钉生产线。
解决方案：Marvie 4 + SCARA。

# 灯具锁螺钉

LED灯具自动锁螺钉
解决方案：Marvie 6 + Articulated Manipulator。

# 随动视觉+SCARA

手机外壳贴标签。
解决方案：Marvie 4 + SCARA + 随动视觉 + 固定视觉检测工具端。

Marvie 家族

# Marvie 驱控一体

- 小体积；
- 高功率密度；
- 支持多品牌伺服电机；
- 高可靠性；
- 工业机器人专用驱控一体；

Marvie 4

Marvie 6

# Marvie 4

| | |
|---|---|
| 轴数 | 4轴 |
| 计算机 | 1GHz/DDR 2GB/DOM 4GB |
| 电源 | 单项 220V |
| 输出 | 750W * 4 |
| 过载 | 120%额定电流30秒，<br>300%额定电流1.5秒 |
| 通信 | Ethernet/RS232/gLink |
| 效率 | 97% |

# Marvie 6

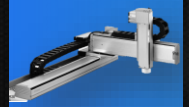
| | |
|---|---|
| 轴数 | 6 + 2 轴 |
| 计算机 | 1.6GHz/DDR 2GB/DOM 4GB |
| 电源 | 单项 220V |
| 输出 | 2KW*2 + 2KW*2 + 750W * 4 |
| 过载 | 120%额定电流30秒，300%额定电流1.5秒 |
| 通信 | Ethernet/RS232/gLink |
| 效率 | 97% |

# 开放式可重组平台

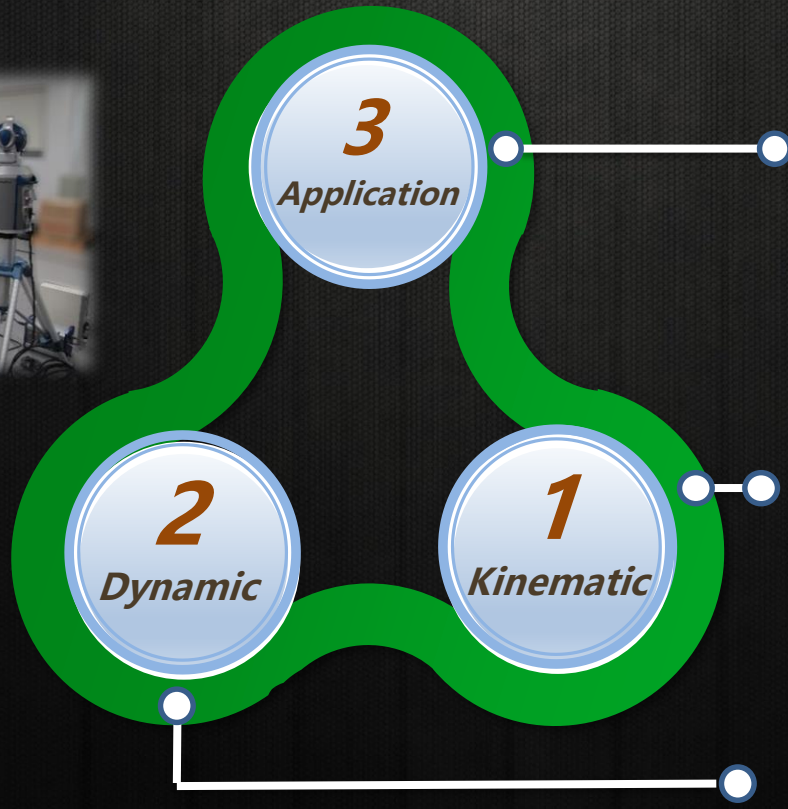
01 02 03

04 05 06

- 支持多机器人构型；
- 多工艺模块；
- 标定算法；
- 动力学前馈；

| 机器人构型 RobotType | 关节配置Axes | | | 应用工艺（Applications） | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Ground | Hand | Aux | Tracking | Arc Welding | Laser Cutting | Palletize | CNC | Vision | Bending |
| Gantry  | LL- | R - - | 2 | - | ✔ | ✔ | - | - | - | - |
| | LL- | RR - | 2 | - | ✔ | ✔ | - | - | - | - |
| | LL- | RRR | 2 | - | ✔ | ✔ | - | - | - | - |
| | LLL | - - - | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| | LLL | R - - | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| | LLL | RR - | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| | LLL | RRR | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| SCARA | RRL | R - - | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| | LRR | R - - | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| | RLR | R - - | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| Articulate | RRR | RRR | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| | RRR | R - R | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| | RRR | - RR | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| | RRR | - R - | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| | RLL | - - R | - | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| | RRR | - - R | - | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| | RL- | LRR | 2 | - | - | - | ✔ | - | - | - |
| | LRL | - - - | 2 | - | - | - | ✔ | - | - | - |
| | LRL | R - - | 2 | - | - | - | ✔ | - | - | - |

| 机器人构型 RobotType | 关节配置Axes | | | 应用工艺（Applications） | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Ground | Hand | Aux | Tracking | Arc Welding | Laser Cutting | Palletize | CNC | Vision | Bending |
| Delta | RR- | - - - | - | ✔ | ✔ | ✔ | - | - | - | - |
| | RRR | - - - | - | ✔ | ✔ | ✔ | - | - | - | - |
| | RRR | - RR | - | ✔ | ✔ | ✔ | - | - | - | - |
| | RRR | - R - | - | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| Tripod | LLL | - - - | - | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| | RRR | - - R | - | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| Customize | LL- | RR- | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| | LLR | RR - | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| | LLR | RRR | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Painting | RRR | RRR | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |
| | RRR | RRR（R） | 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | - |




- **跟踪+视觉工艺**（Tracking + Vision）
- **弧焊工艺**（Arc Welding）
- **激光切割工艺**（Laser Cutting）
- **码垛工艺**（Palletize）
- **数控工艺**（CNC）
- **折弯跟随**（Bend Follow）

- **运动学**（Direct / Inverse Kinematic）
- **全参运动学解算**（POE Dir/Inv Kinematic）
- **路径规划**（Path Planning）
- **速度规划**（Trajectory Planning）
- **坐标系转换**（Coordinate Transformation）
- **运动学标定**（Kinematic Calibration）

- **动力学前馈**（Dynamic Feed-forward Compensation）
- **动力学自适应控制**（Dynamic Adaptive Control ）
- **拖动示教**（Robot Teaching by Dragging）
- **碰撞检测**（Collision Detection）
- **能量优化**（Energy Optimal Trajectory）

# 运动学参数标定——评价与提高性能（ Kinematics: Kinematic Parameters Calibration ）

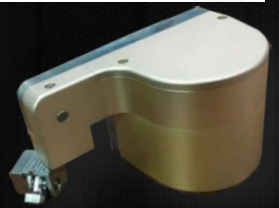
INTERNATIONAL STANDARD

ISO 9283

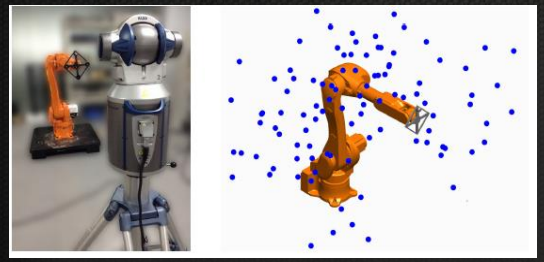
Second edition
1998-04-01

Manipulating industrial robots — Performance criteria and related test methods

Robots manipulateurs industriels — Critères de performance et méthodes d'essai correspondantes

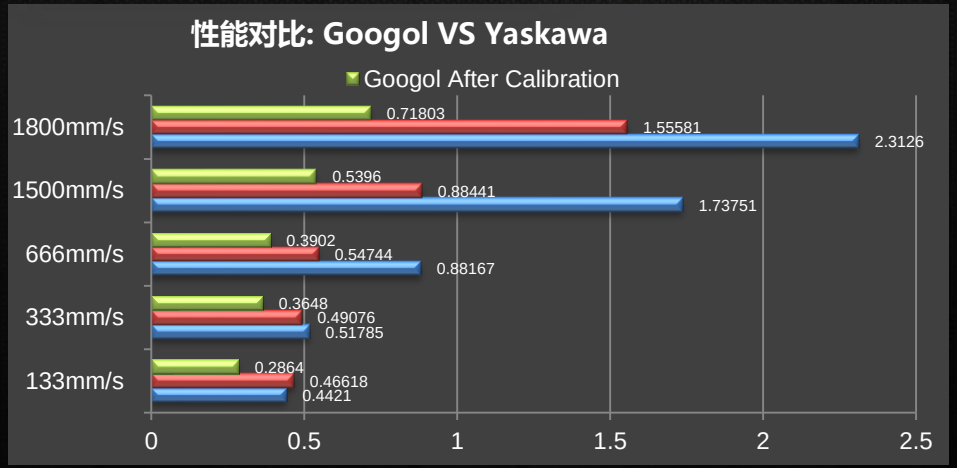


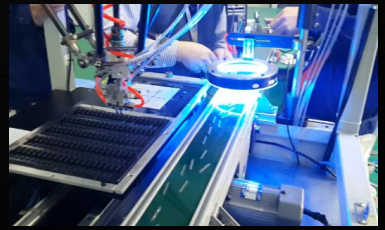
## 运动学标定（Calibration）



- Hard to carry
- Very expensive

- Light;
- Cheap;
- Simple;
- Integrate into GT robot control system.





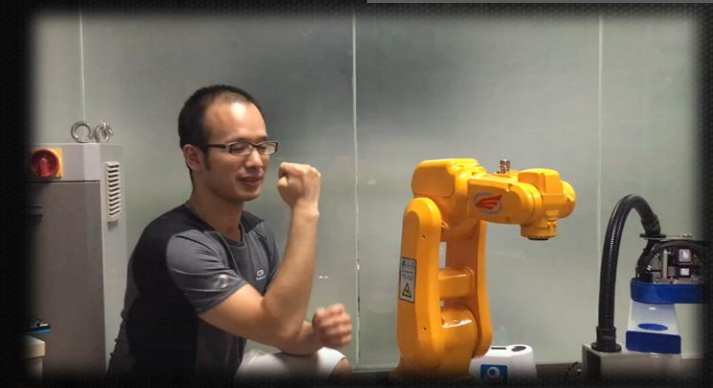
- **固高仅提供机器人控制系统平台**（Googol only provides general robot controller without robot itself）
- **设计一套系统来辨识不同机器人本体的动力学参数**（To design a system to identify robot dynamic model for better performance）
- **动力学应用一：无传感拖动示教**（Dynamic Based Application: Robot Teaching by Dragging）

**Marvie 4** + EFORT C604

**Marvie 6** + Kawasaki BA006N

# 动力学参数辨识（Dynamic Control (Dynamic Parameters Identification & Dynamic Based Application) ）

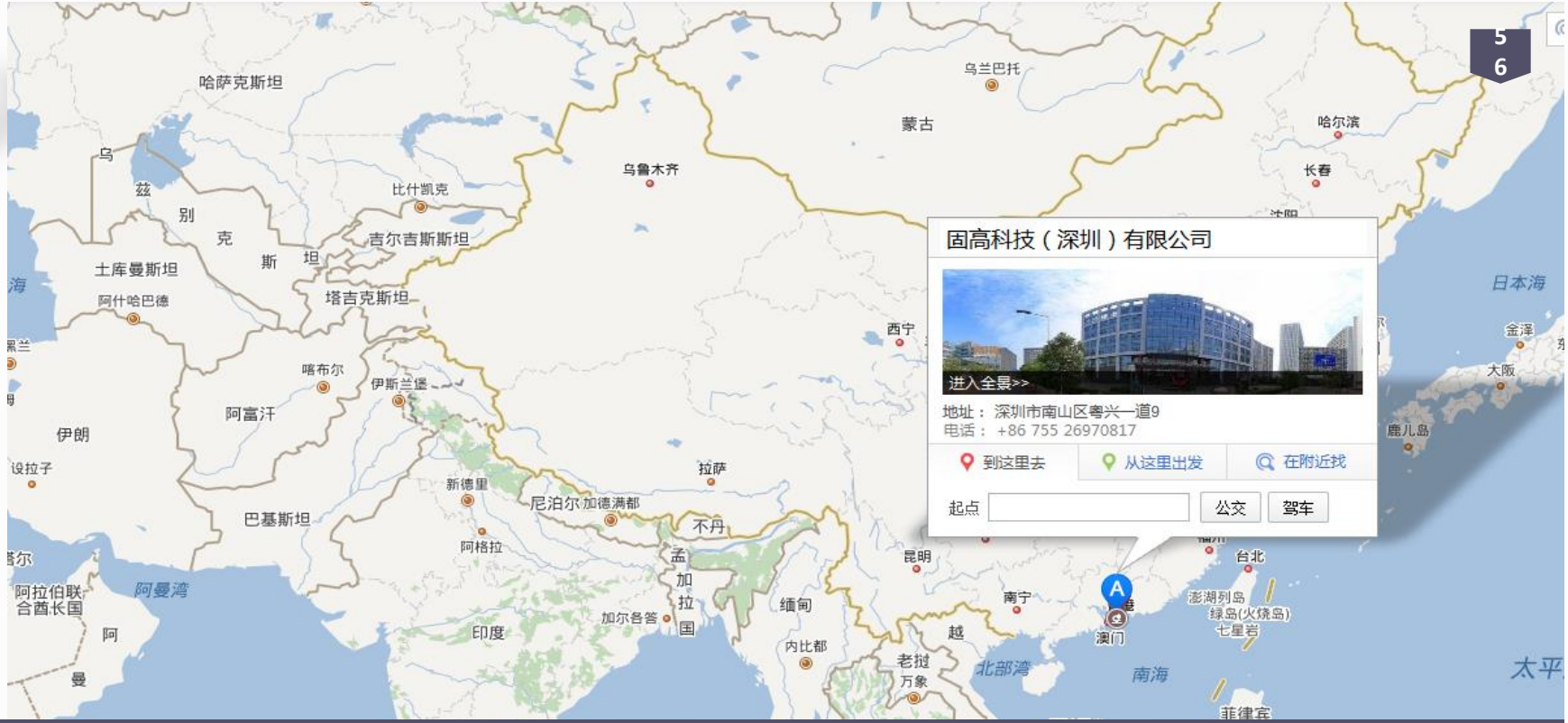
- **动力学应用二：碰撞检测**（Dynamic Based Application: Collision Detect ）



20kg payload Robot

3kg payload Robot

4~6kg payload Robot




# 谢谢观看！

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# THANK YOU

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