



PC300 Lectures

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Transistors and diodes



Transistors and diodes

- ▶ diodes like zener diode; reverse current changes



Transistors and diodes

- ▶ diodes like zener diode; reverse current changes
- ▶ transistors: base comes from environment; pull-up on output (or pull-down)



Single-chip devices



Single-chip devices

- ▶ Hall effect



Single-chip devices

- ▶ Hall effect
- ▶ Temperature, etc.



Single-chip devices

- ▶ Hall effect
- ▶ Temperature, etc.
- ▶ linear, usually 5V in



Available transducers



Available transducers

UGN3503 Hall sensor



Available transducers

UGN3503 Hall sensor

PDB-C107 photodiode



Available transducers

UGN3503 Hall sensor

PDB-C107 photodiode

PDB-V107 photodiode



Available transducers

UGN3503 Hall sensor

PDB-C107 photodiode

PDB-V107 photodiode

MRD-310 phototransistor

Available transducers

UGN3503 Hall sensor

PDB-C107 photodiode

PDB-V107 photodiode

MRD-310 phototransistor

GP2Y0A21YK-1 Infrared distance sensor



Wiring tips



Wiring tips

- ▶ “Extra” current from TTL



Wiring tips

- ▶ “Extra” current from TTL
- ▶ sink instead of source



Wiring tips

- ▶ “Extra” current from TTL
- ▶ sink instead of source
- ▶ 0.4ml vs. 8 ml (LS)



Outline



Outline

▶ robot;



Outline

- ▶ robot;
- ▶ courses(2)



Outline

- ▶ robot;
- ▶ courses(2)
- ▶ start with flashlight



Outline

- ▶ robot;
- ▶ courses(2)
- ▶ start with flashlight
- ▶ straight line; along wall;

Outline

- ▶ robot;
- ▶ courses(2)
- ▶ start with flashlight
- ▶ straight line; along wall;
stop with front less than 1m from wall without hitting

Outline

- ▶ robot;
- ▶ courses(2)
- ▶ start with flashlight
- ▶ straight line; along wall;
stop with front less than 1m from wall without hitting
- ▶ around back island ccw



Schedule



Schedule

- ▶ Nov. 13; block diagram and schedule



Schedule

- ▶ Nov. 13; block diagram and schedule
- ▶ (due Friday morning)



Schedule

- ▶ Nov. 13; block diagram and schedule
- ▶ (due Friday morning)
- ▶ Nov. 20; progress report



Schedule

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- ▶ (due Friday morning)
- ▶ Nov. 20; progress report
- ▶ Nov. 27; progress report



Schedule

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- ▶ (due Friday morning)
- ▶ Nov. 20; progress report
- ▶ Nov. 27; progress report
- ▶ Dec. 4; demos



Schedule

- ▶ Nov. 13; block diagram and schedule
- ▶ (due Friday morning)
- ▶ Nov. 20; progress report
- ▶ Nov. 27; progress report
- ▶ Dec. 4; demos
- ▶ Dec. 7; documentation due.



Subtask marks



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If you have parts of the project ready early, you can demonstrate them to reduce weight on final demo.

- ▶ After one week



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15% per task

Subtask marks

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15% additional if two or more tasks

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 - 15% per task
 - 15% additional if two or more tasks
- ▶ After two weeks

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 - 15% per task
 - 15% additional if two or more tasks
- ▶ After two weeks
 - 10% per task

Subtask marks

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 - 15% additional if two or more tasks
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 - 15% additional if two or more tasks
- ▶ After two weeks
 - 10% per task
 - 10% additional if two or more tasks
- ▶ After three weeks

Subtask marks

If you have parts of the project ready early, you can demonstrate them to reduce weight on final demo.

- ▶ After one week
 - 15% per task
 - 15% additional if two or more tasks
- ▶ After two weeks
 - 10% per task
 - 10% additional if two or more tasks
- ▶ After three weeks
 - 5% per task

Subtask marks

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 - 15% additional if two or more tasks
- ▶ After two weeks
 - 10% per task
 - 10% additional if two or more tasks
- ▶ After three weeks
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 - 5% additional if two or more tasks

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Hints



Hints

- ▶ Block diagram;



Hints

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- ▶ How to start with light?



Hints

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- ▶ How to start with light?
- ▶ How to control motors?



Hints

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- ▶ How to start with light?
- ▶ How to control motors?
- ▶ How to determine if straight?



Hints

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- ▶ How to start with light?
- ▶ How to control motors?
- ▶ How to determine if straight?
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Hints

- ▶ Block diagram;
- ▶ How to start with light?
- ▶ How to control motors?
- ▶ How to determine if straight?
- ▶ How to determine when to stop?
- ▶ Motor control options: (untested)

Hints

- ▶ Block diagram;
- ▶ How to start with light?
- ▶ How to control motors?
- ▶ How to determine if straight?
- ▶ How to determine when to stop?
- ▶ Motor control options: (untested)
- ▶ 1 fixed speed; other can go faster or
- ▶ slower