Team member: Qi Zhao, Ke Xu, Ferguson Shi.

**The materials that we need**

**Raspberry-Pi Development Kit**

**GPS module** (compatible with Raspberry-Pi), if it is too expensive, maybe we can use cell phone to get GPS data.

**Attitude sensor** (compatible with Raspberry Pi)

**Solar-energy charge-discharge modules**: include two DC-DC converters, Solar Panel, rechargeable batteries (such as Power bank))

**Two Step-motors, axles and gears** (compatible with step-motors and axles)

**Light** (<=5w)

**3-D printer.**

**Budget:**

Raspberry-Pi Development Kit: $50

GPS module: $50

Attitude sensor: $11

two DC-DC converters: $20

Solar Panel (>=10w): $30

Rechargeable-batteries: $15

Two step-motors, axles and gears: $20

Light: $10

3-D printer: ?

Total: about $200

Materials

Solar Charge Controller 1: x1 $20.99

<https://www.amazon.com/gp/product/B06XWTKYDC/ref=ox_sc_act_title_1?smid=A18M12GR6V2Z8F&psc=1>

Two DV-DV converters: x2 $9.99 x 2

<https://www.amazon.com/gp/product/B079HY3N1S/ref=ox_sc_act_title_13?smid=A1I1T9PMJRD9SL&psc=1>

Rechargeable batteries: x1 $18.57

<https://www.amazon.com/gp/product/B009NEKAEA/ref=ox_sc_act_title_2?smid=ATVPDKIKX0DER&psc=1>

battery holder: x1 $ 8.00

<https://www.amazon.com/gp/product/B00VE7HBMS/ref=ox_sc_act_title_3?smid=A353AQG9I0DZD6&psc=1>

Steel axis1: x1 $8.06

<https://www.amazon.com/gp/product/B00FHMA3D0/ref=ox_sc_act_title_4?smid=A1THAZDOWP300U&psc=1>

steel axis2: x1 $8.49

<https://www.amazon.com/gp/product/B0723BRMRT/ref=ox_sc_act_title_5?smid=A1M8G92U41XEUX&psc=1>

solar panel power: x1 $21.95

<https://www.amazon.com/gp/product/B071CZ4HCS/ref=ox_sc_act_title_6?smid=A3BG62S1F23IH5&psc=1>

gear1: x1 $1.49

<https://www.amazon.com/gp/product/B00V66YJQI/ref=ox_sc_act_title_7?smid=A36I7QL8841UPM&psc=1>

gear2: x1 $ 10.99

<https://www.amazon.com/gp/product/B06XMXP5F8/ref=ox_sc_act_title_8?smid=A36OLJK51DOCLZ&psc=1>

Lamp base: x1 $8.99

<https://www.amazon.com/gp/product/B06XRZ3M39/ref=ox_sc_act_title_9?smid=A1EBQ087Q9F826&psc=1>

Lamps: x1 $5.99

<https://www.amazon.com/gp/product/B01BRN3O6K/ref=ox_sc_act_title_10?smid=AFVLWC4GC6BLQ&psc=1>

step motors: x1 $12.99

<https://www.amazon.com/gp/product/B01IP7IOGQ/ref=ox_sc_act_title_11?smid=A3IRH1M32QHQ71&psc=1>

solar energy bulb: x1 $12.99

<https://www.amazon.com/gp/product/B071GNGTRD/ref=ox_sc_act_title_12?smid=A33NMDVK8RW4QH&psc=1>

solar power bank x1 $21.99

<https://www.amazon.com/gp/product/B01MQ4R15B/ref=ox_sc_act_title_14?smid=A1CNW5E0C9S28F&psc=1>

solar panel1: x1 $19.99

<https://www.amazon.com/gp/product/B00FF1KEMI/ref=ox_sc_act_title_15?smid=A5KU5HDAPDC75&psc=1>

solar panel 2: x1 $24.88

<https://www.amazon.com/gp/product/B071ZV2KYN/ref=ox_sc_act_title_16?smid=A2ACZILVJ1K7Z0&psc=1>

outdoor solar lamp: x1 $14.99

<https://www.amazon.com/gp/product/B074WP6YVV/ref=ox_sc_act_title_17?smid=A1HBSF59SIKAA3&psc=1>

attitude sensor1: x1 $35.99

<https://www.amazon.com/gp/product/B06XGR1B79/ref=ox_sc_act_title_18?smid=A2OCOGC9B25845&psc=1>

attitude sensor2: x1 $9.99

<https://www.amazon.com/gp/product/B06XHK8BK6/ref=ox_sc_act_title_19?smid=A26ATEC08S9EFM&psc=1>

GPS module: x1 $20.99

<https://www.amazon.com/gp/product/B01AW5QYES/ref=ox_sc_act_title_20?smid=A3WSD51PE9OSV&psc=1>

Raspberry Pi 3 kit: x1 $89.99

<https://www.amazon.com/gp/product/B01C6Q4GLE/ref=ox_sc_act_title_21?smid=A30ZYR2W3VAJ0A&psc=1>

Total: $398.29