Design and Development of an Autonomous Helicopter

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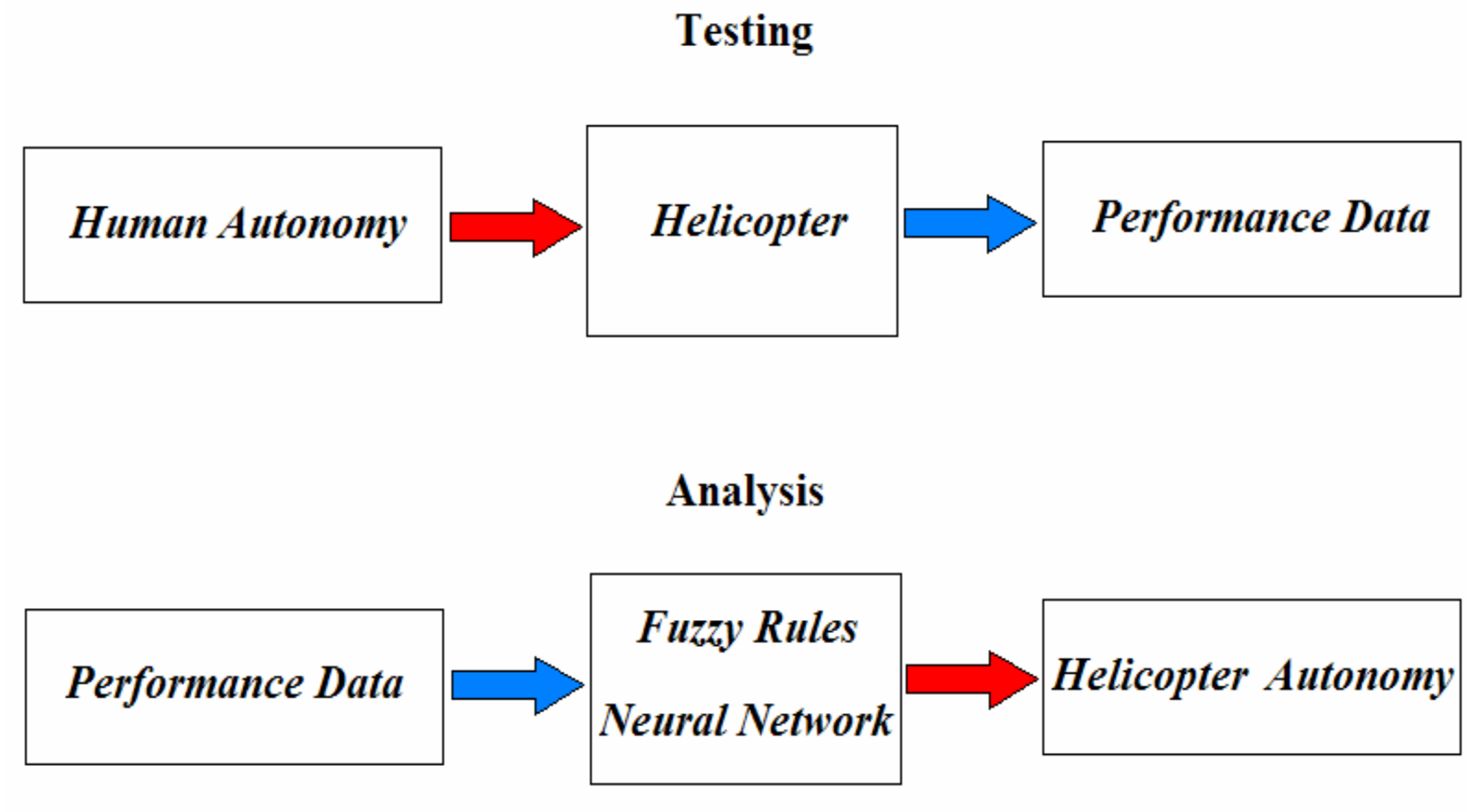
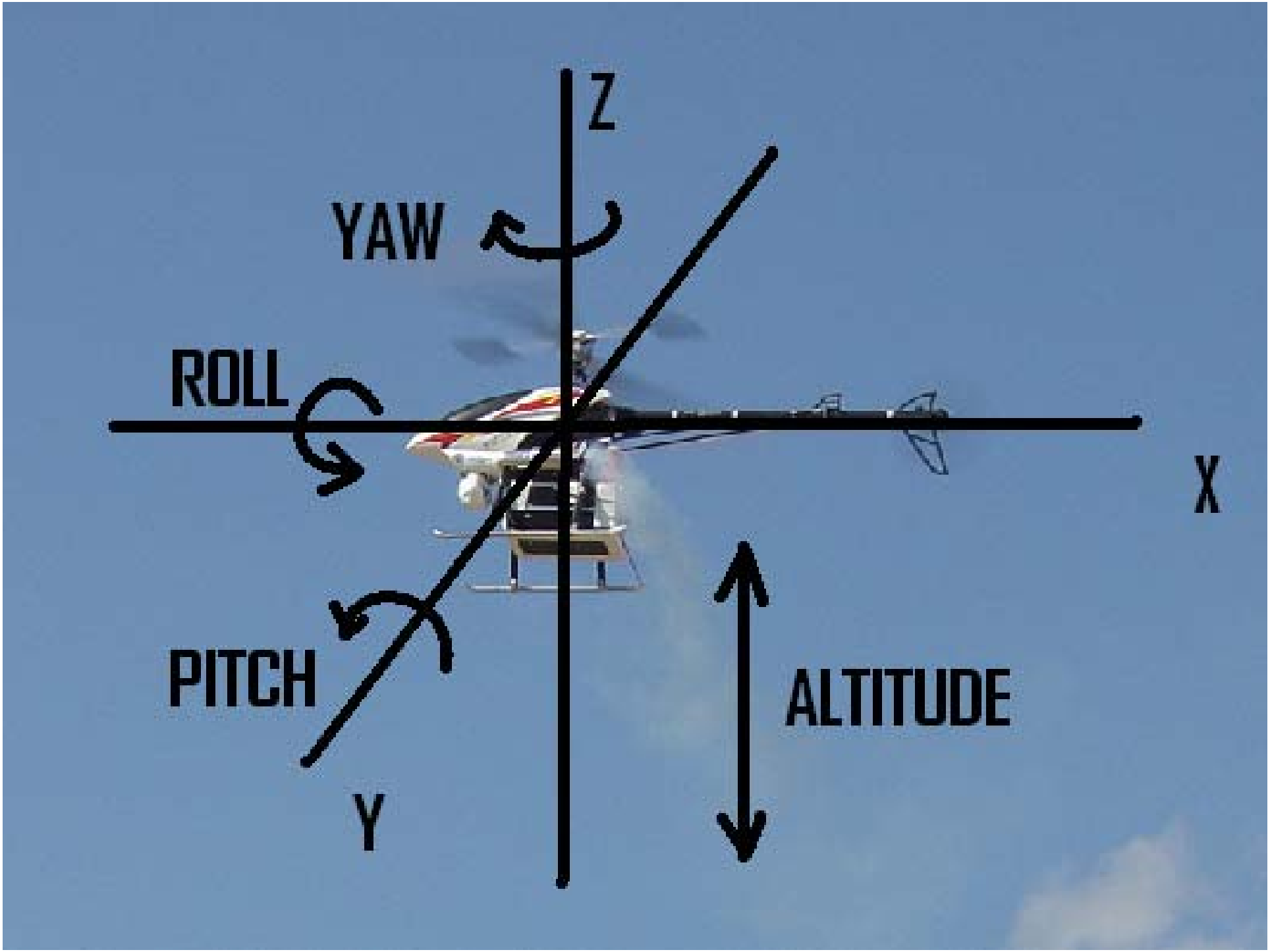
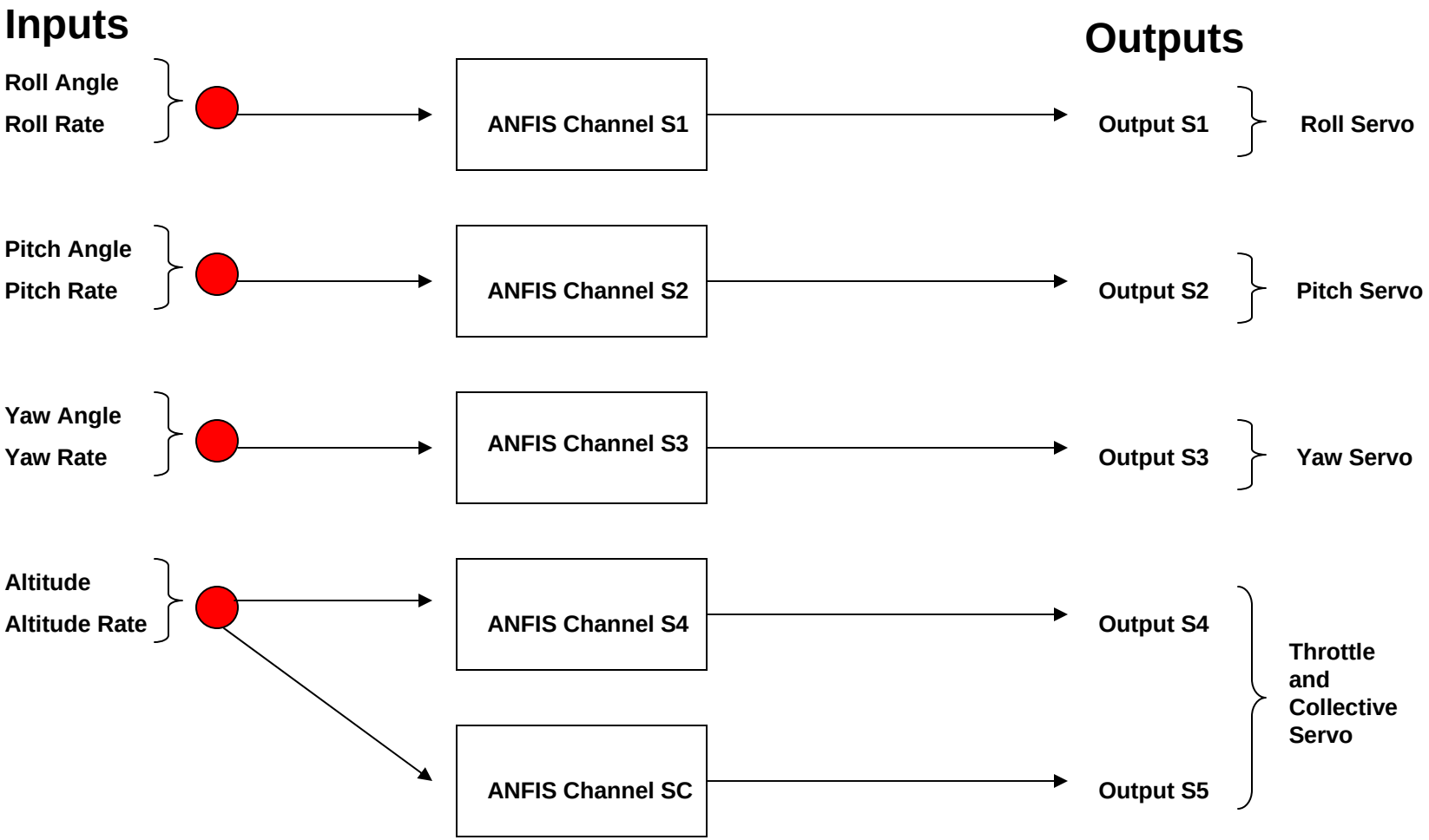
Test & Analysis Objectives




Z
YAW
ROLL
X
PITCH
ALTITUDE
Y

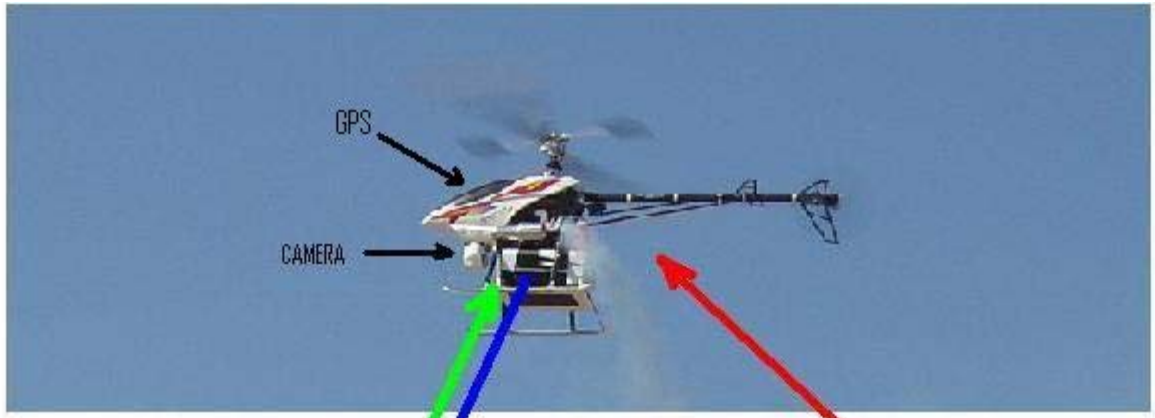
ANFIS Architecture



Rule Structure for Control

- If x_1 is A_{j1} and … and x_n is A_{jn}, then
  $u_j = f(x_1, x_2, \ldots, x_n)$
  - x_i is the observed values of the input
  - A_{ij} are fuzzy partitions
  - f_j are functions
- Example:

  If Yaw Angle is MF_i and Yaw Rate is MF_j, then the output is f(Yaw Angle, Yaw Rate)
- Fuzzy rules for each ANFIS channel are structured similarly

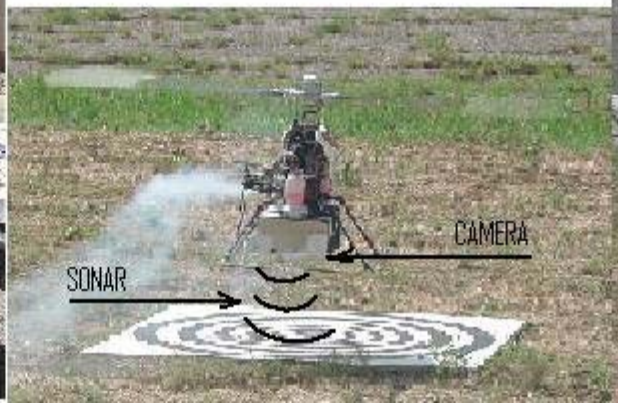


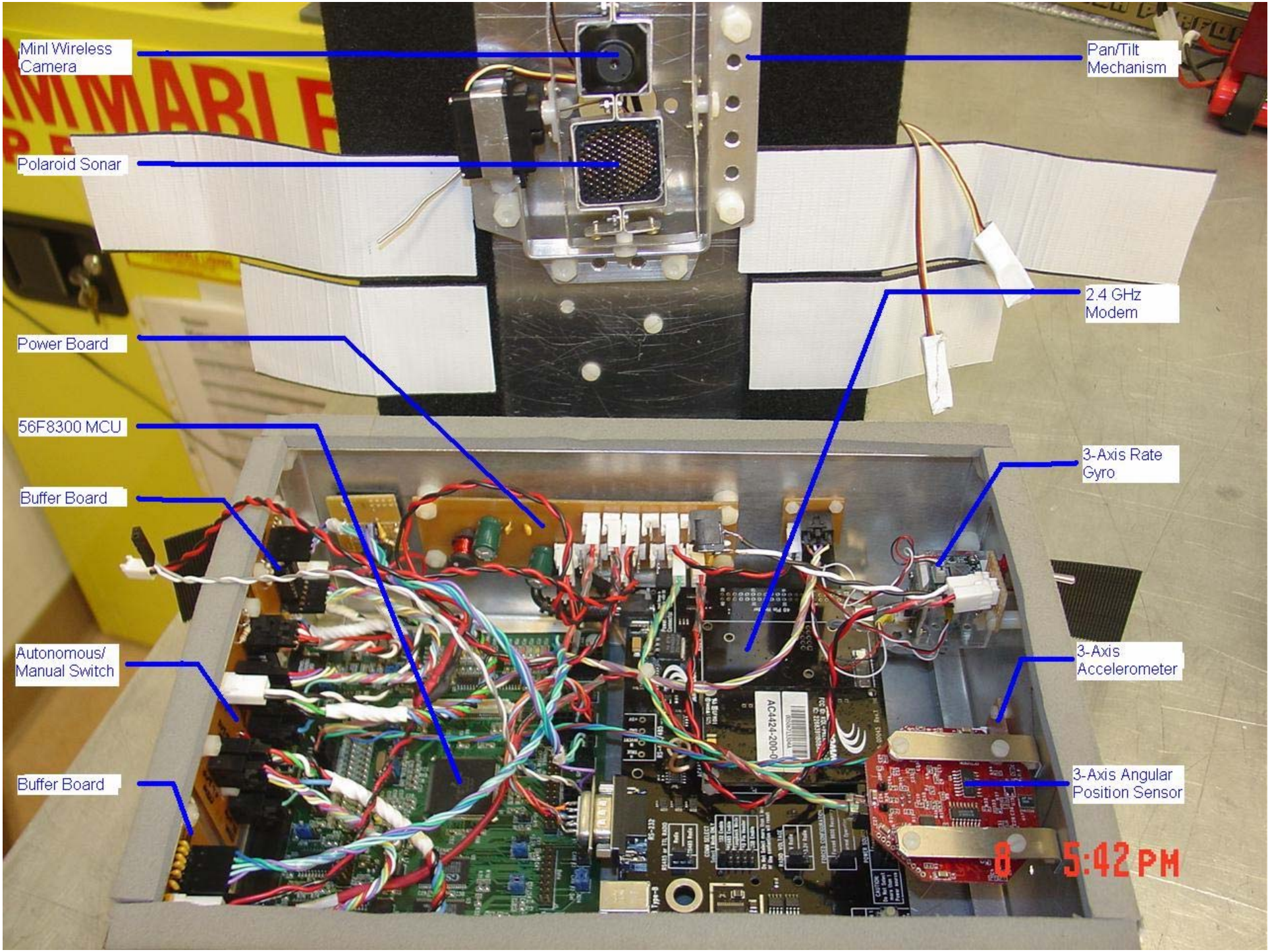
* CONTROL COMMANDS UPLINKED

SENSOR DATA DOWNLINKED

RC TRANSMITTER

* Still being developed




Minl Wireless Camera
Pan/Tilt Mechanism
Polaroid Sonar
2.4 GHz Modem
Power Board
56F8300 MCU
3-Axis Rate Gyro
Buffer Board
Autonomous/ Manual Switch
3-Axis Accelerometer
Buffer Board
3-Axis Angular Position Sensor
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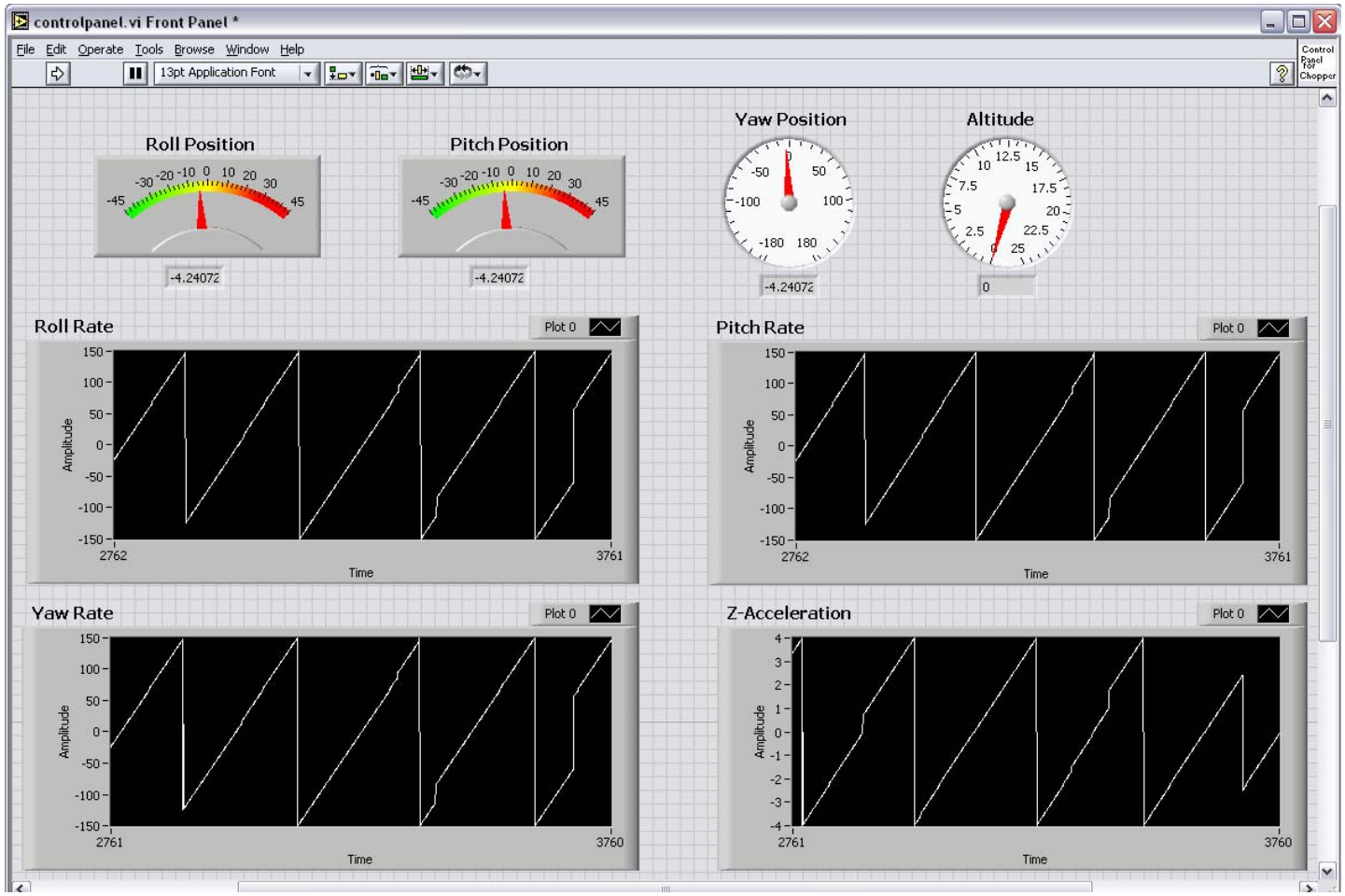
3 5:14 PM

LabView Control Panel Ex.




Ground Station
Future Development
RAPTOR
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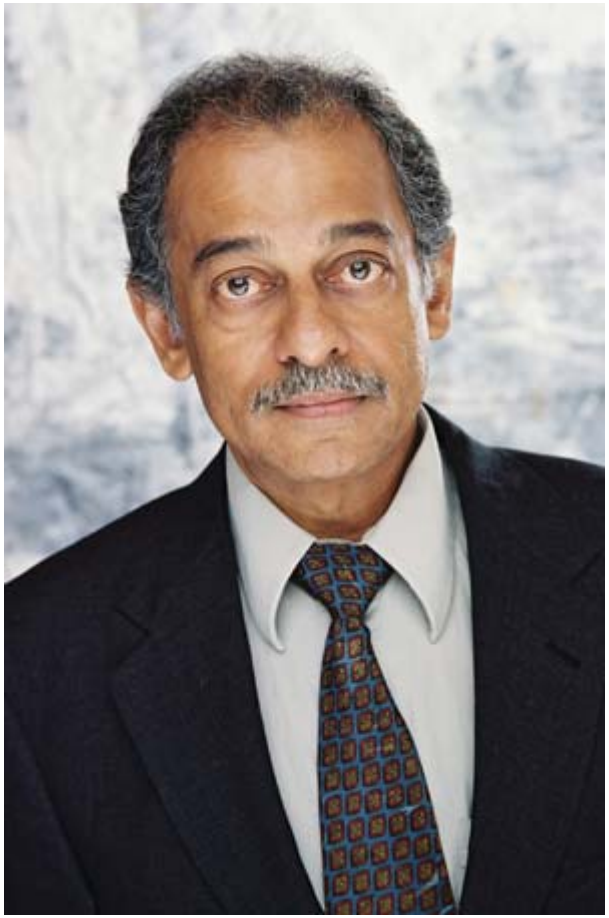
New Mexico Space Grant Consortium



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