DRONE TRACKING OPERATION

Duke Humans and Autonomy Lab

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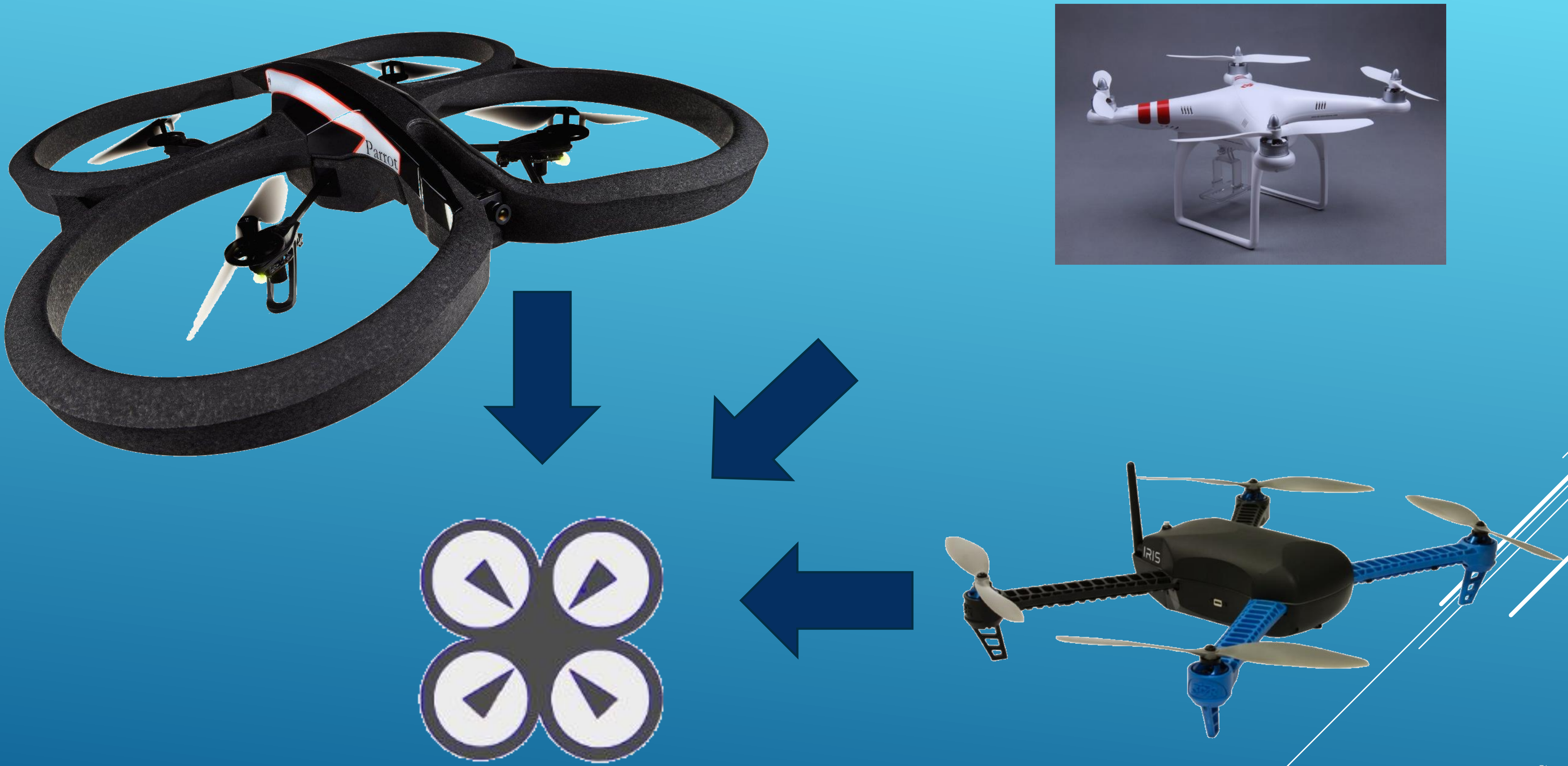
- Creation of Route
- Operation - proximity of animal
  - Video operation
- Returning Home
- Loitering


Parrot
IRIS

Multi-platform GUI

OBJECTS

Home (Location of User)

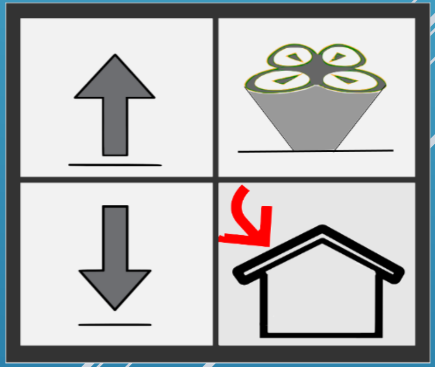
Tracking UAV

Animal (Target for Tracking)

CONTROLS

Take Off

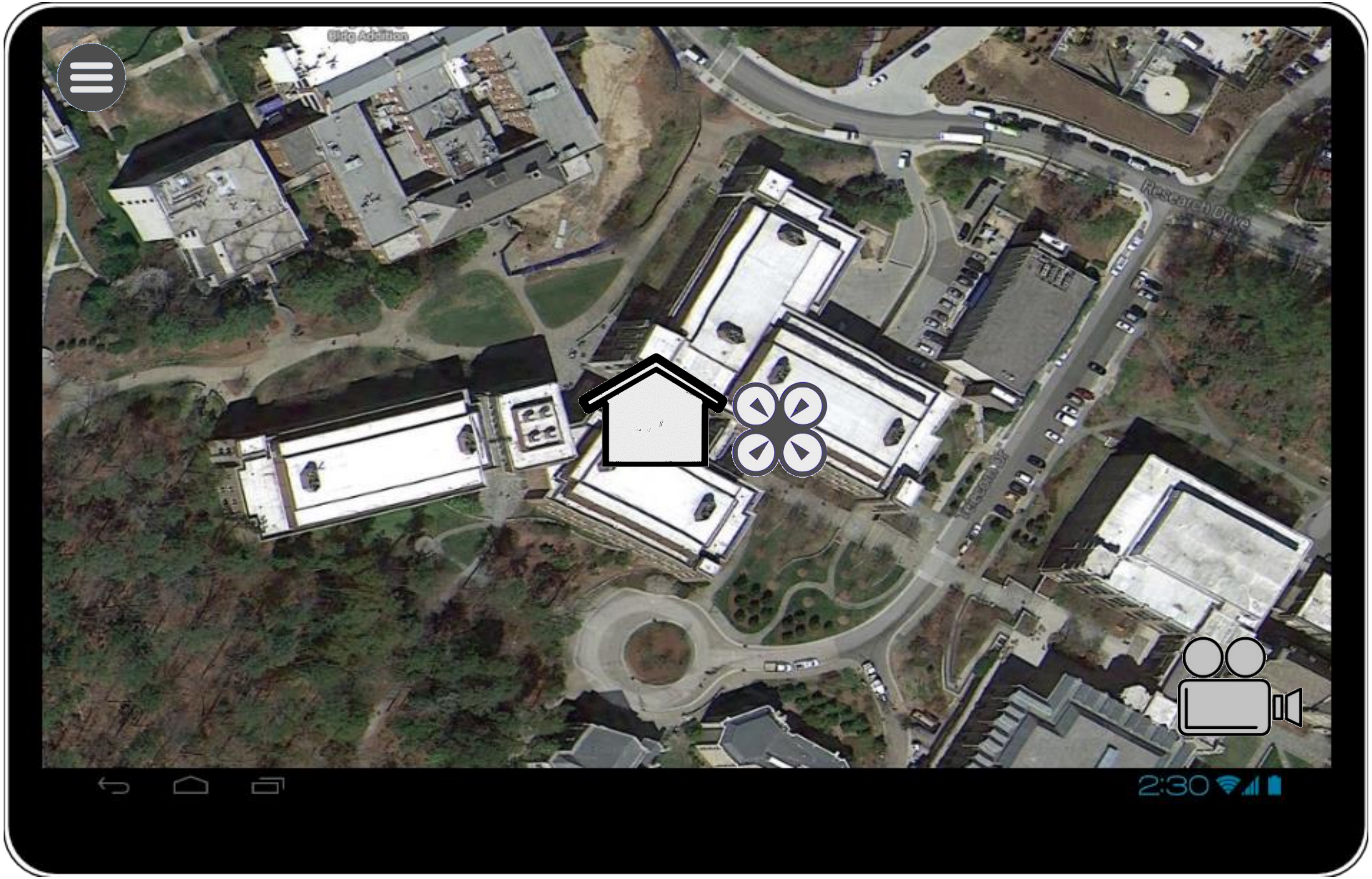
Loiter (Hover in Place)

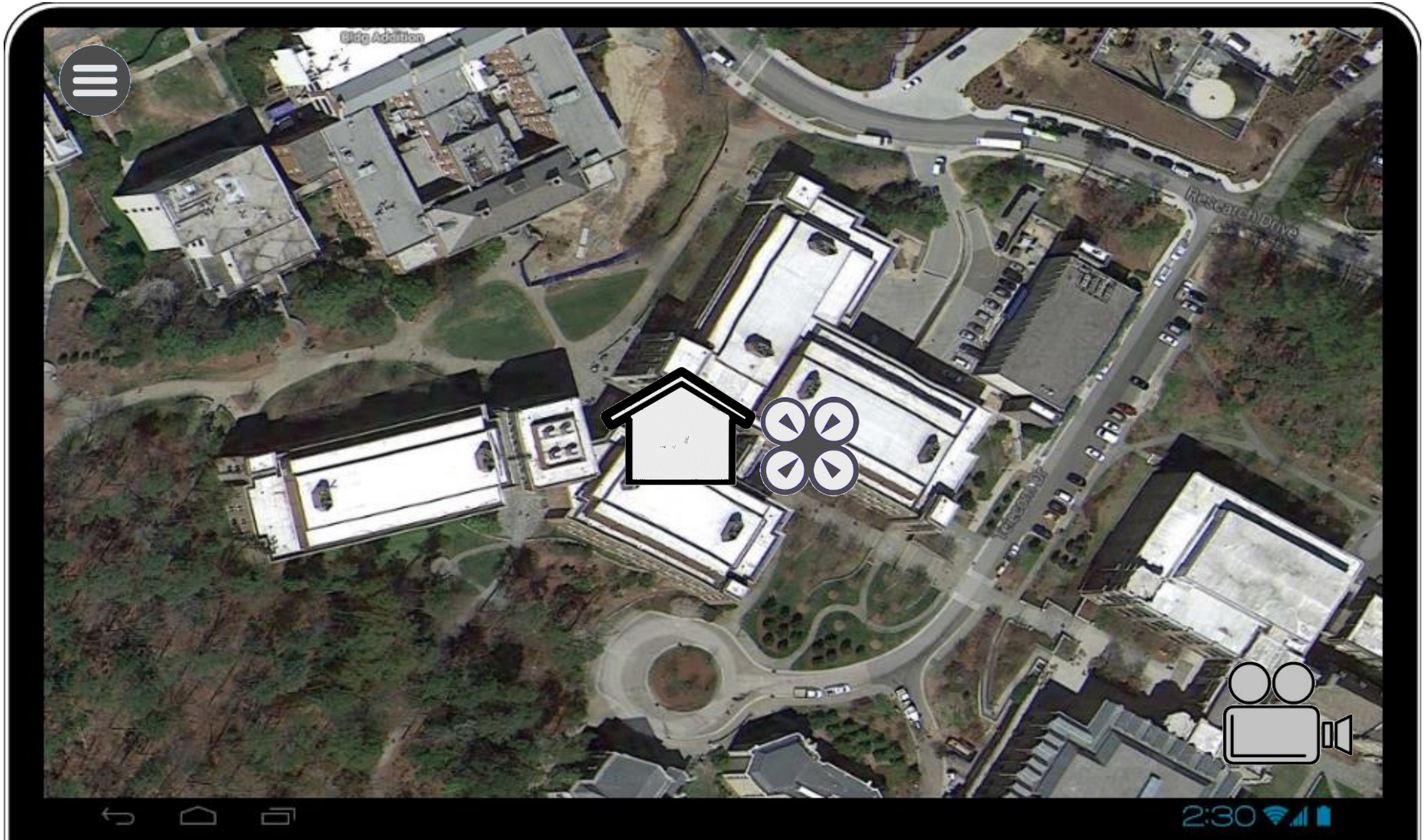


Land

Return Home

Display Video Feed

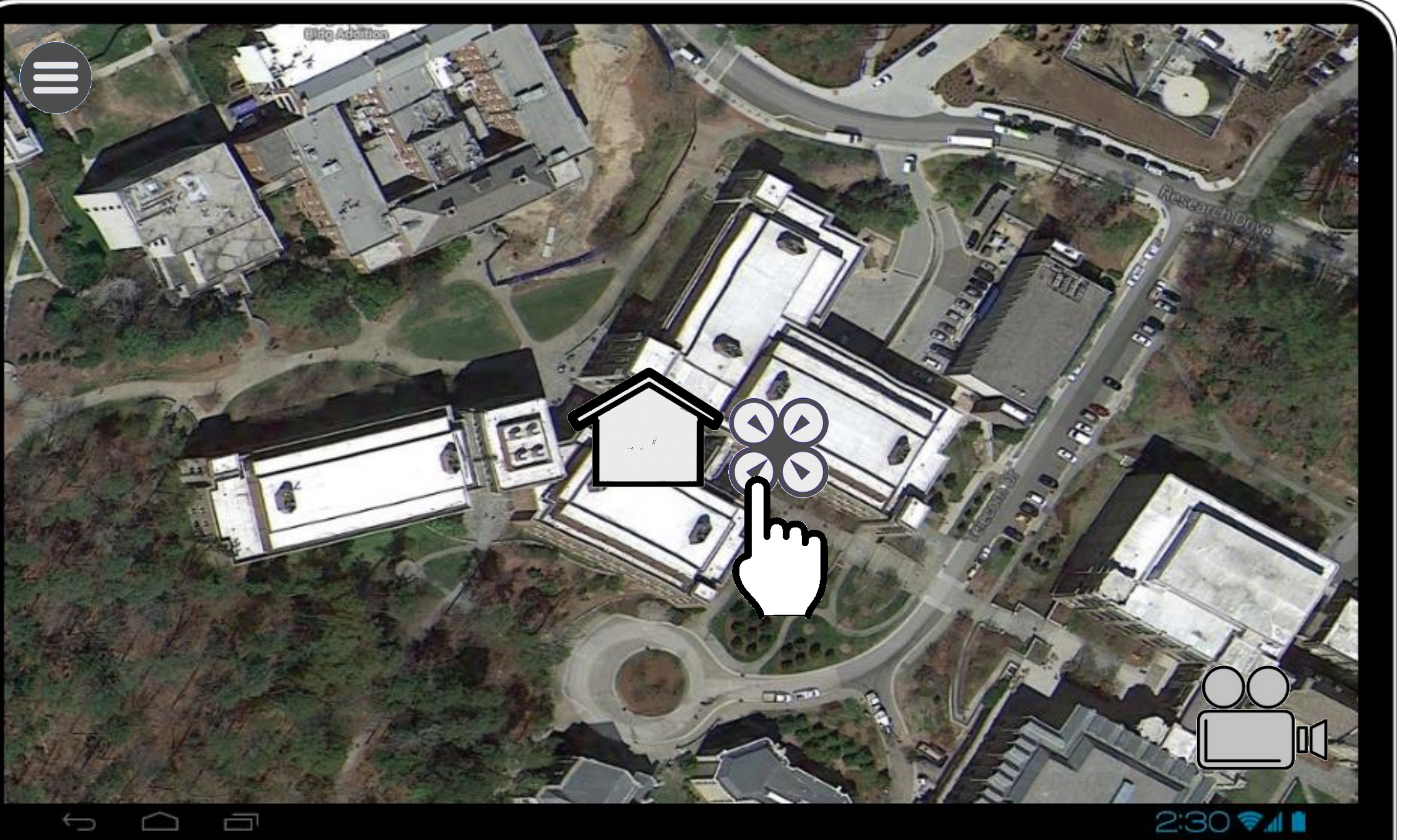

Bldg Addition
Research Drive
2:30


Bldg Addition
Research Drive
2:30

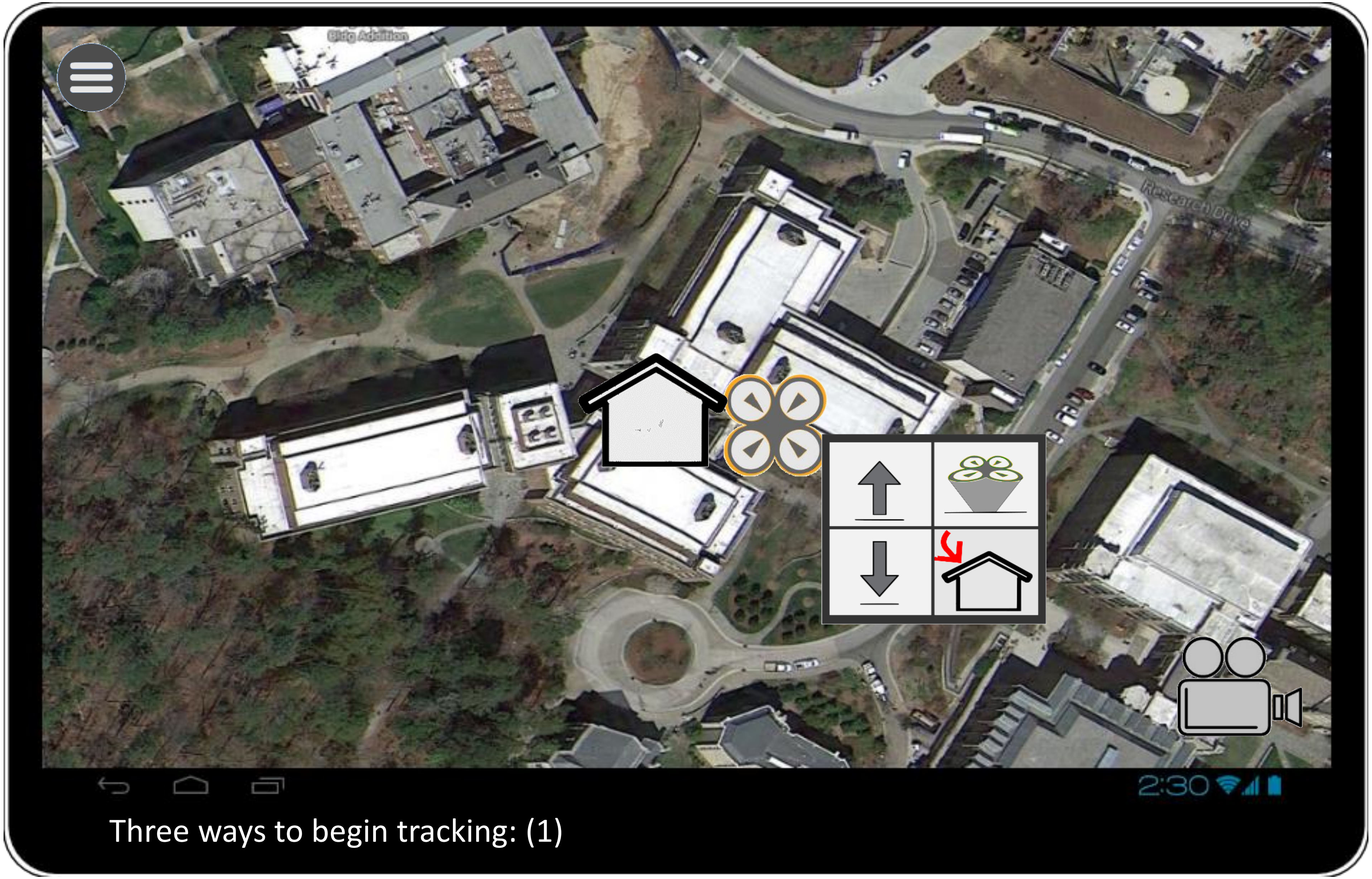
Three ways to begin tracking

OPTION 1

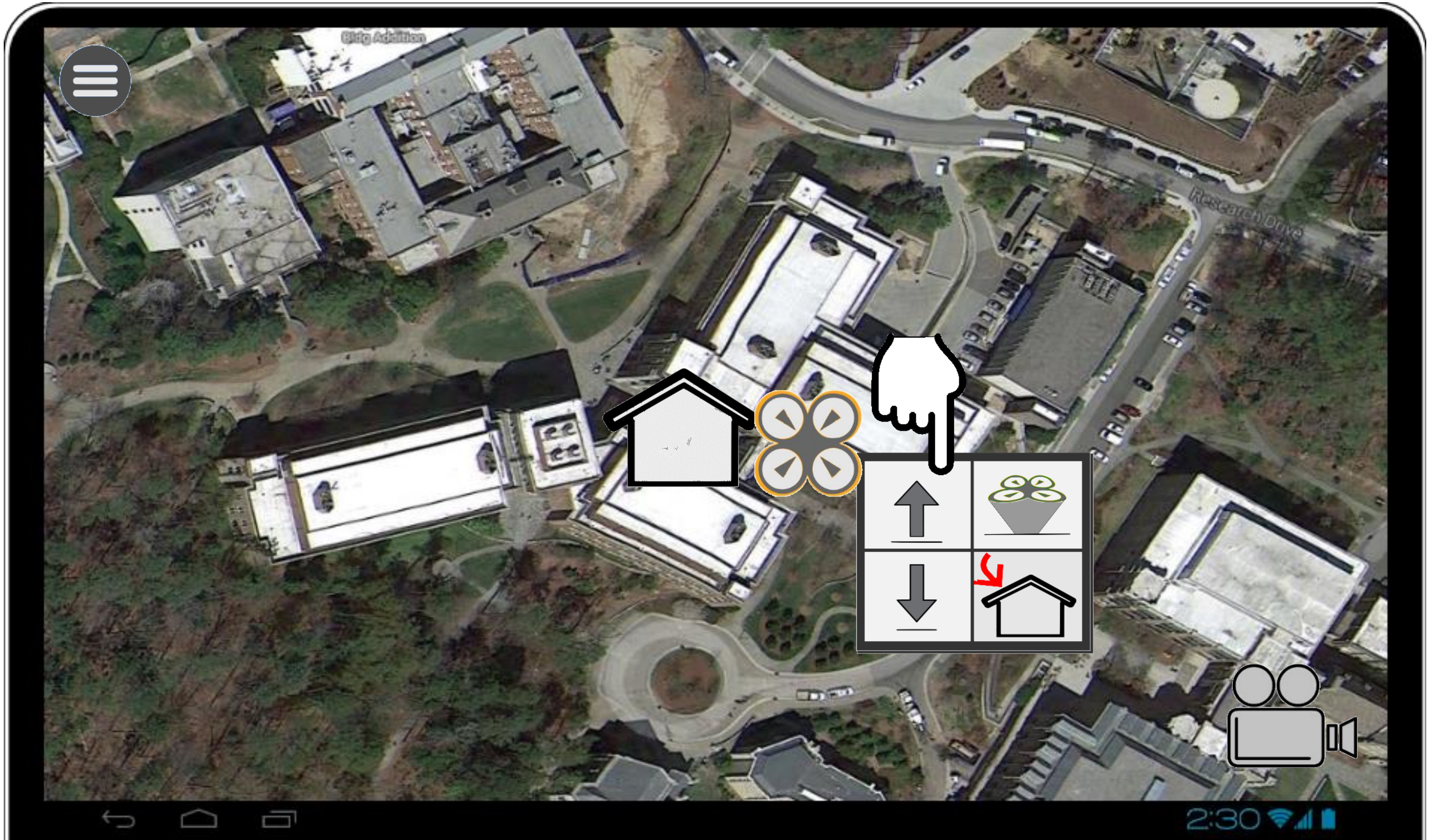
From Drone icon (on screen)


Bldg Addition
Research Drive
2:30

Three ways to begin tracking: (1)


Bldg Addition
Research Drive
2:30

Three ways to begin tracking: (1)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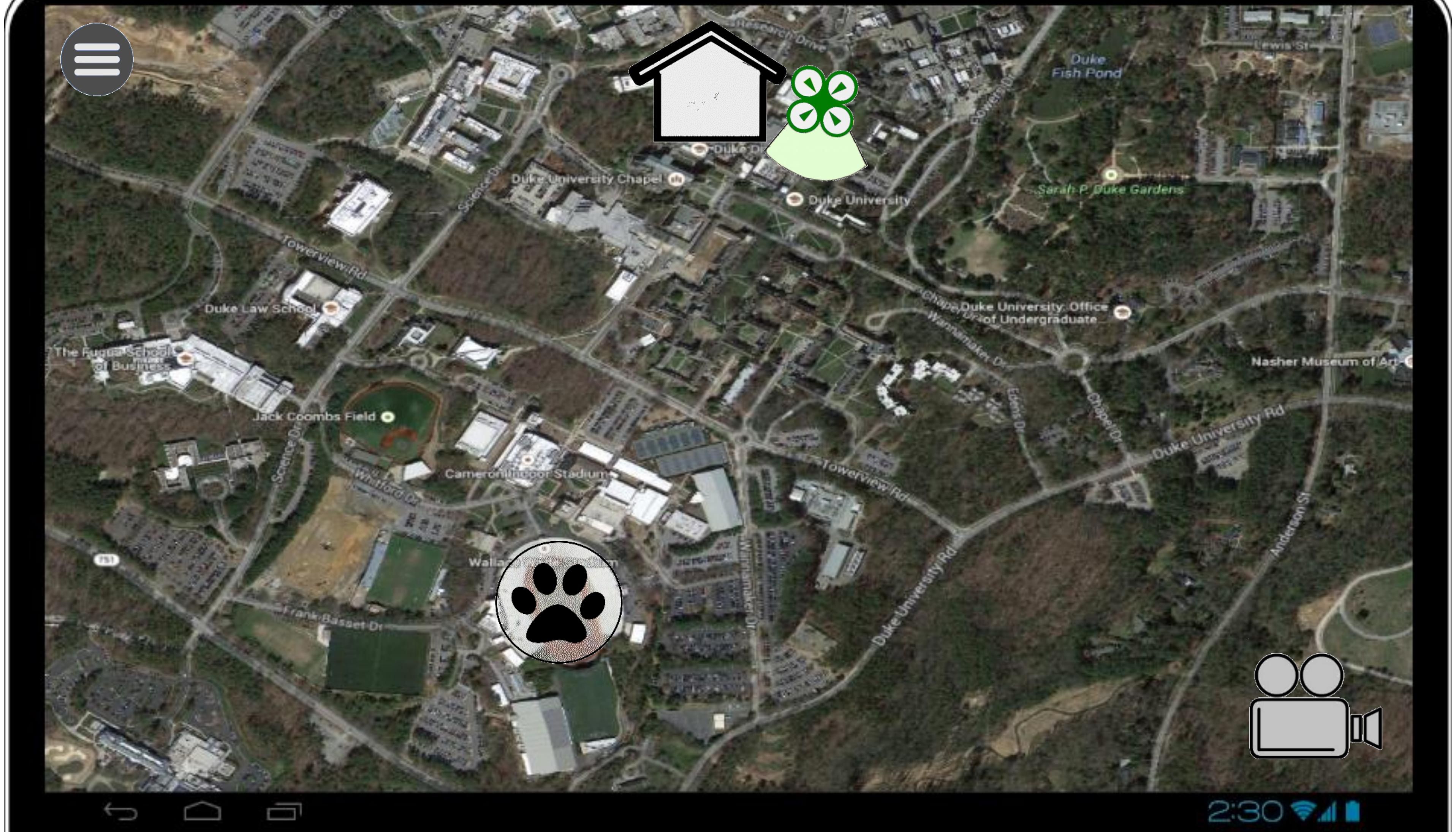
Research Drive
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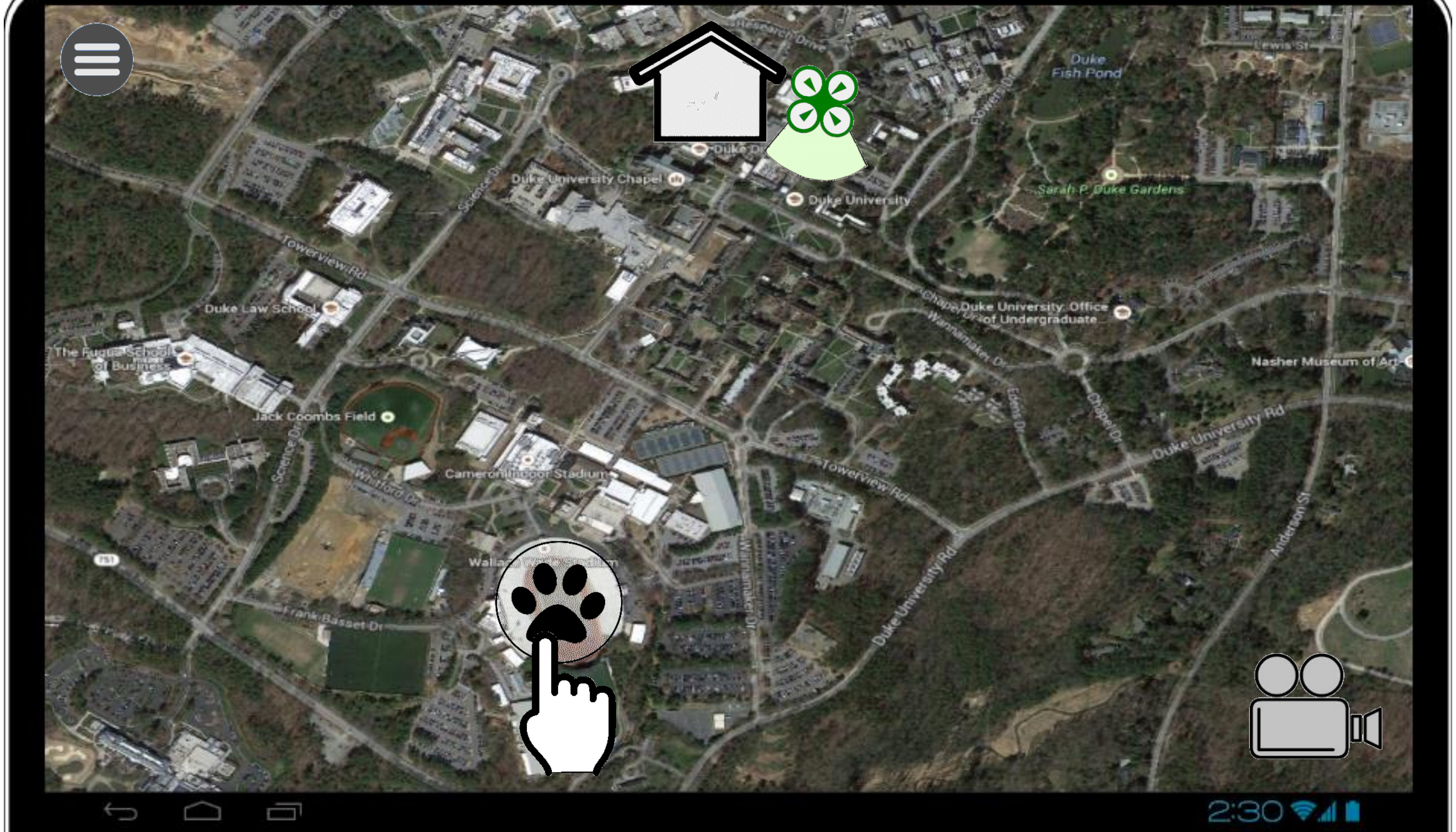
Duke University Chapel
Duke University
Duke Fish Pond
Lewis St
Sarah P. Duke Gardens
Towerview Rd
Science Dr
Duke Law School
The Fuqua School of Business
Duke University Office of Undergraduate
Chapel Dr
Wannamaker Dr
Nasher Museum of Art
Jack Coombs Field
Cameron Indoor Stadium
Whitford Dr
Edens Dr
Duke University Rd
Anderson St
Frank Basset Dr
Wallace Wade Stadium
Wannamaker Dr
751
2:30

Three ways to begin tracking: (1)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Lewis St
Duke University Chapel
Duke University
Sarah P. Duke Gardens
Towerview Rd
Duke Law School
Duke University Office of Undergraduate
Chapel Dr
Wannamaker Dr
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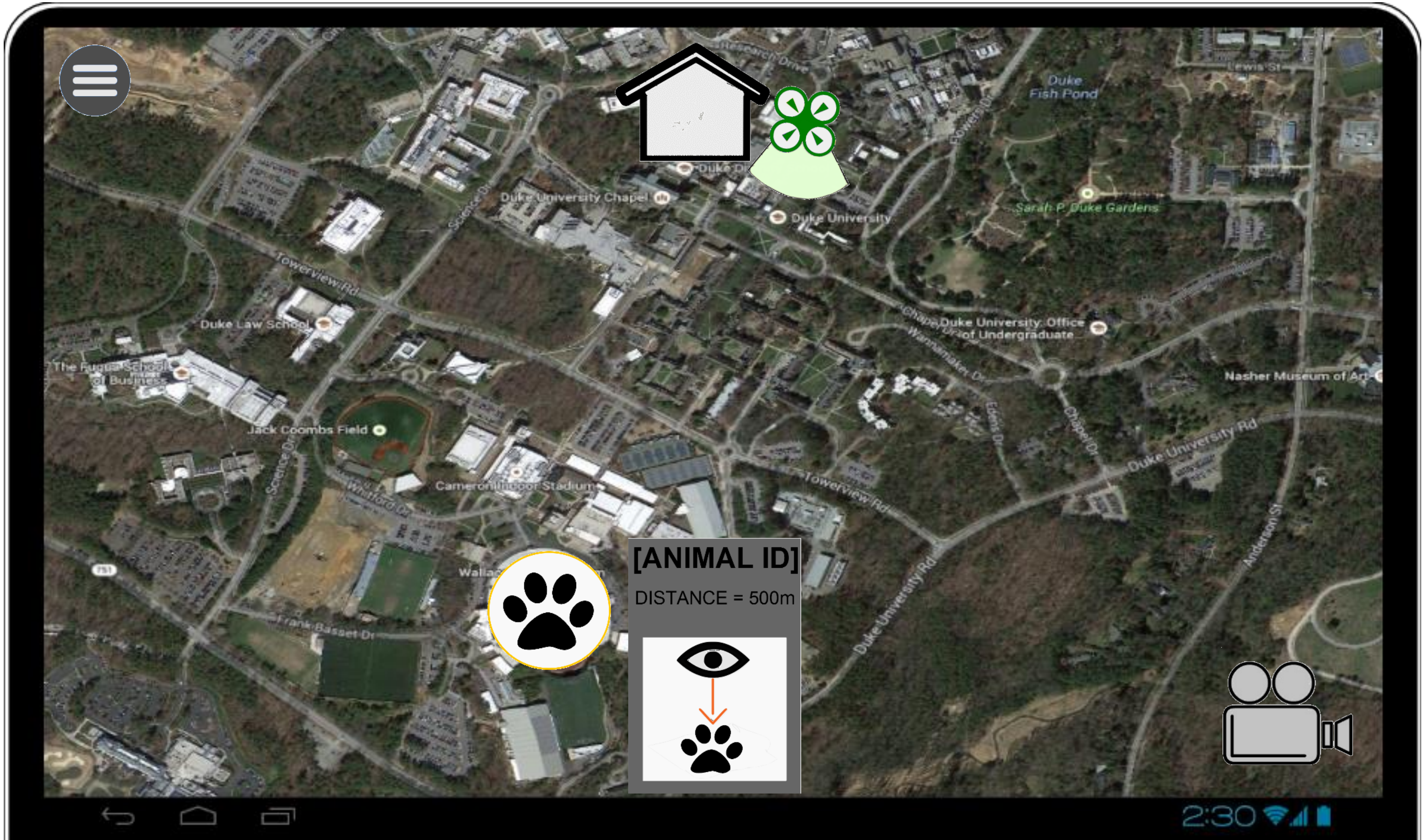
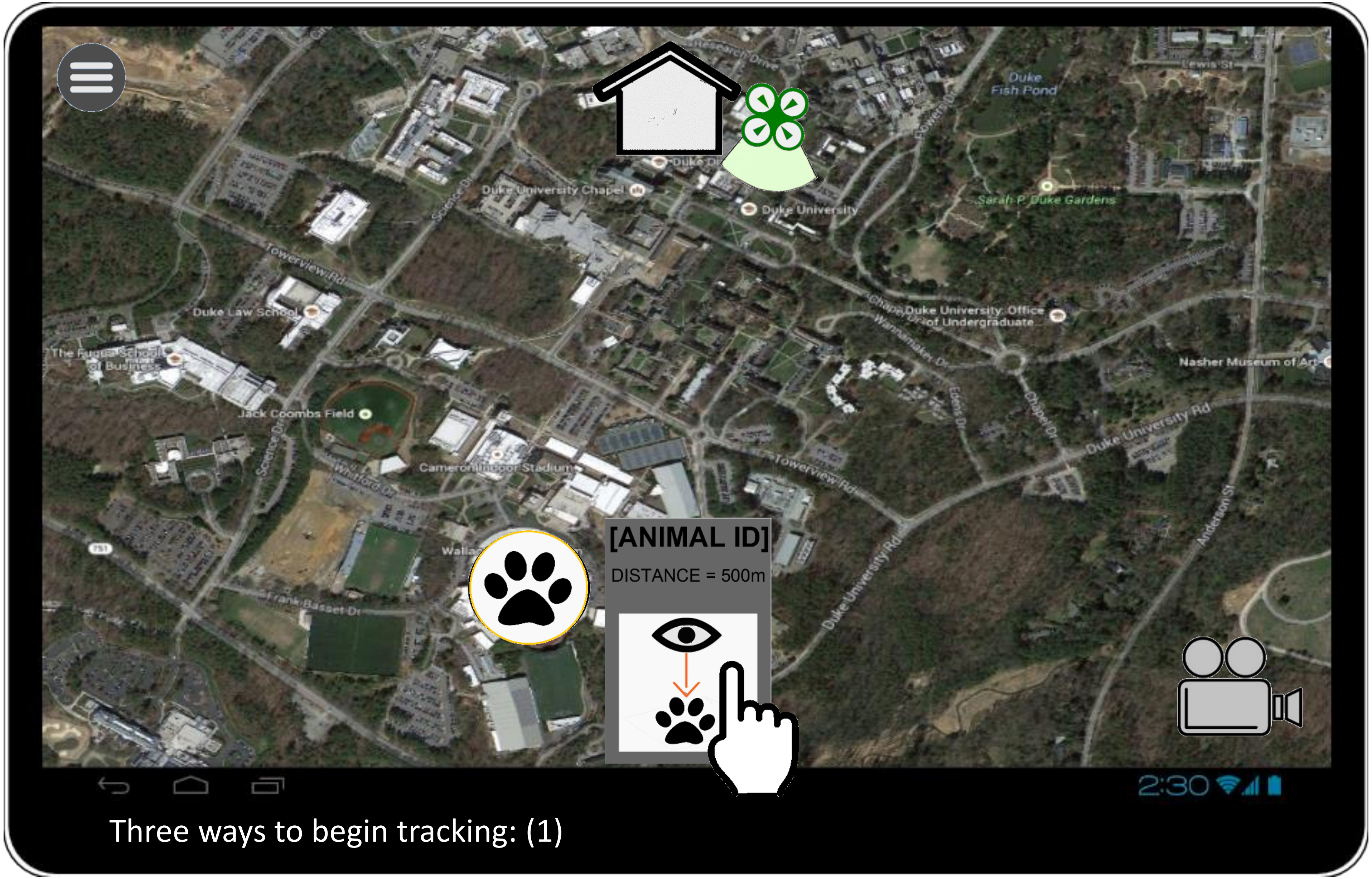
Jack Coombs Field
Science Dr
Edens Dr
Duke University Rd
Cameron Indoor Stadium
Whitford Dr
Towerview Rd
Anderson St
Frank Basset Dr
Wallace Wade Stadium
Wannamaker Dr
Duke University Rd
751
2:30

Three ways to begin tracking: (1)


Research Drive
Duke Fish Pond
Lewis St
Duke University Chapel
Duke University
Sarah P. Duke Gardens
Science Dr
Towerview Rd
Duke Law School
Chapel Dr
Duke University Office of Undergraduate
Wannamaker Dr
The Fuqua School of Business
Nasher Museum of Art
Jack Coombs Field
Duke University Rd
Cameron Indoor Stadium
Whitford Dr
Frank Basset Dr
Anderson St
[ANIMAL ID]
DISTANCE = 500m
2:30

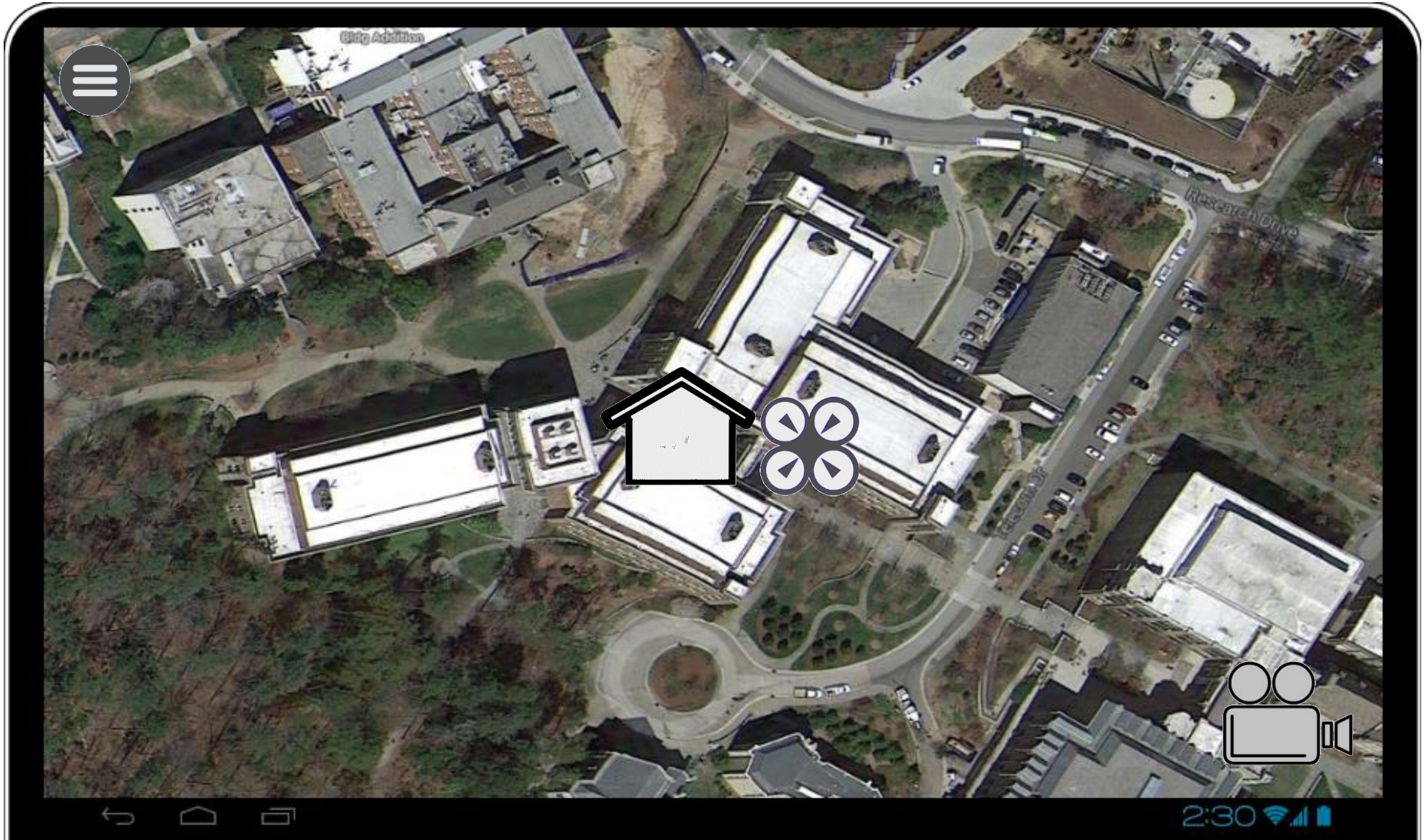
Three ways to begin tracking: (1)


[ANIMAL ID]
DISTANCE = 500m
2:30
Duke University Chapel
Duke University
Duke Fish Pond
Sarah P. Duke Gardens
Duke Law School
The Fuqua School of Business
Jack Coombs Field
Cameron Indoor Stadium
Duke University Office of Undergraduate
Nasher Museum of Art
Towerview Rd
Duke University Rd
Anderson St
Research Drive
Frank Basset Dr
Science Dr
Chapel Dr

Three ways to begin tracking: (1)

OPTION 2

From Drone icon (in sidebar)


Bldg Addition
Research Drive
2:30

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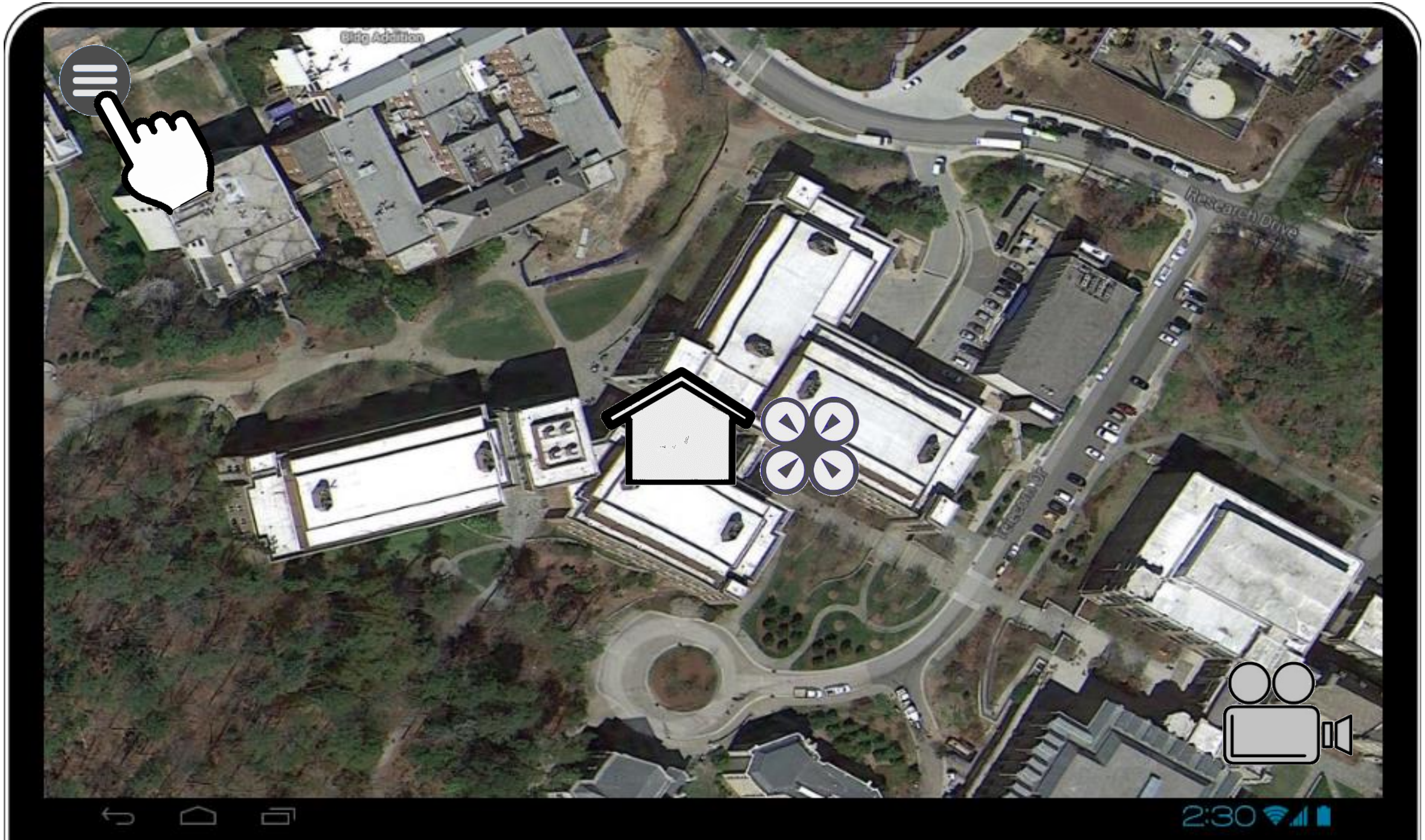
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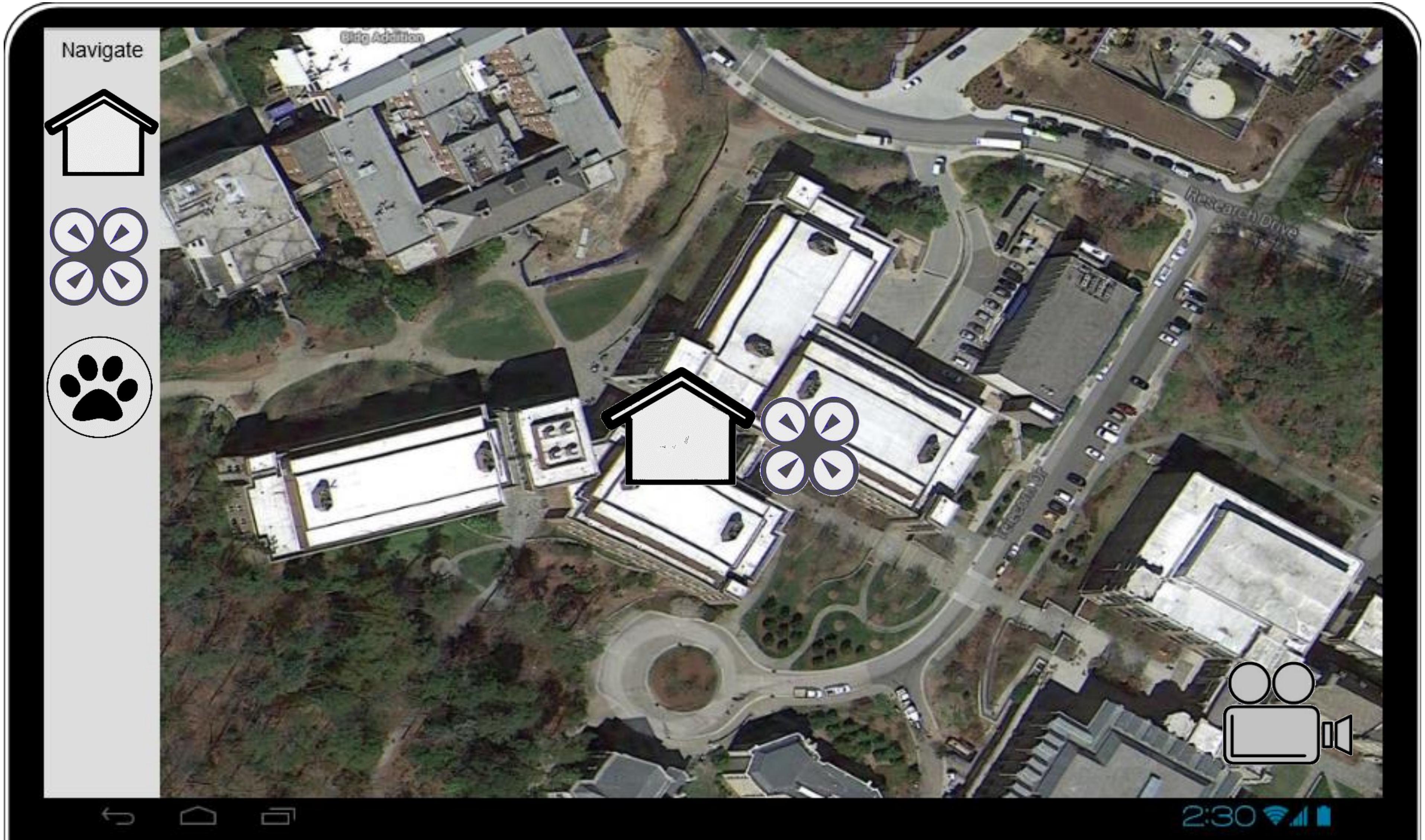
Three ways to begin tracking: (2)


Navigate
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Research Drive
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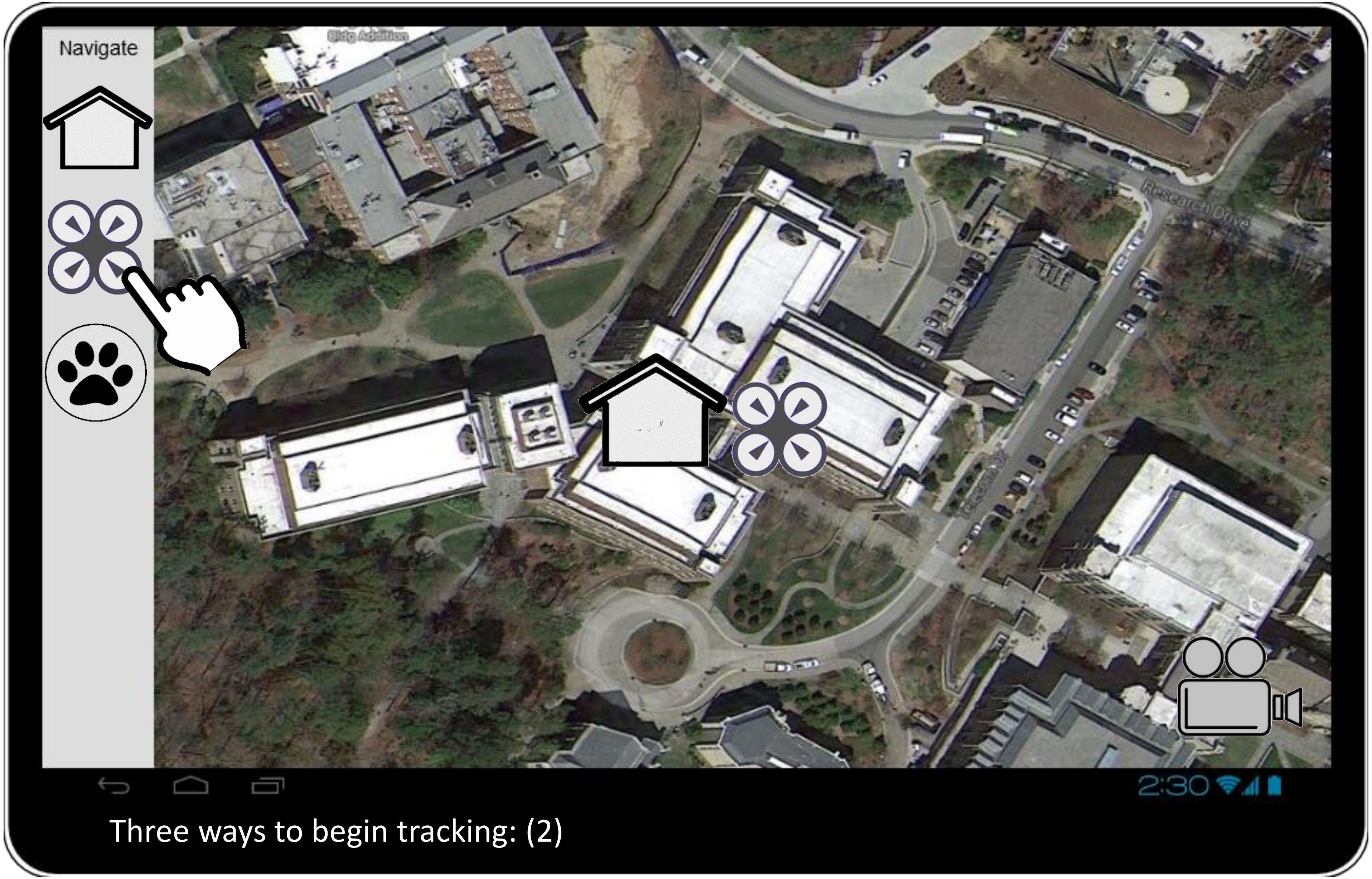
Three ways to begin tracking: (2)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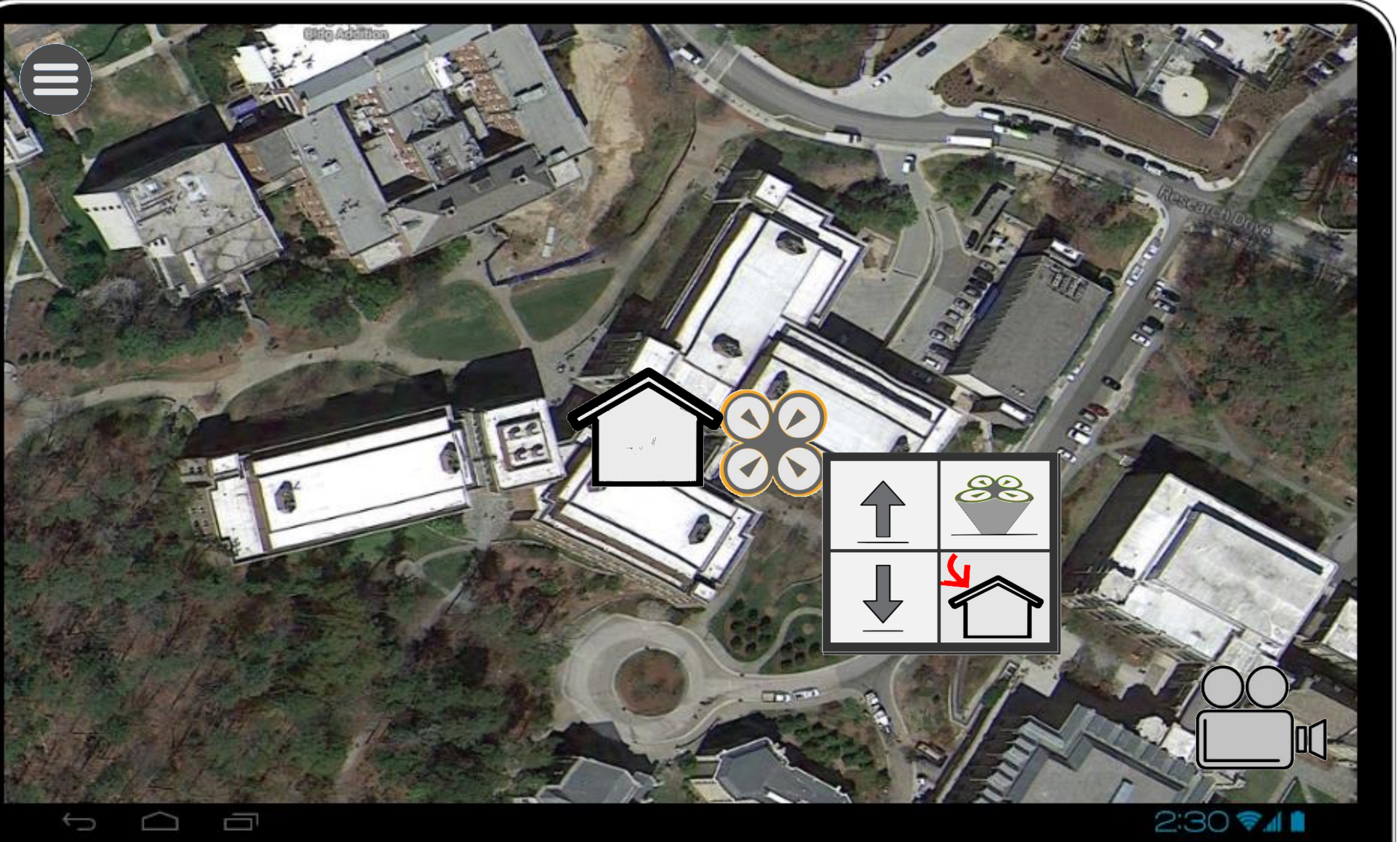
Three ways to begin tracking: (2)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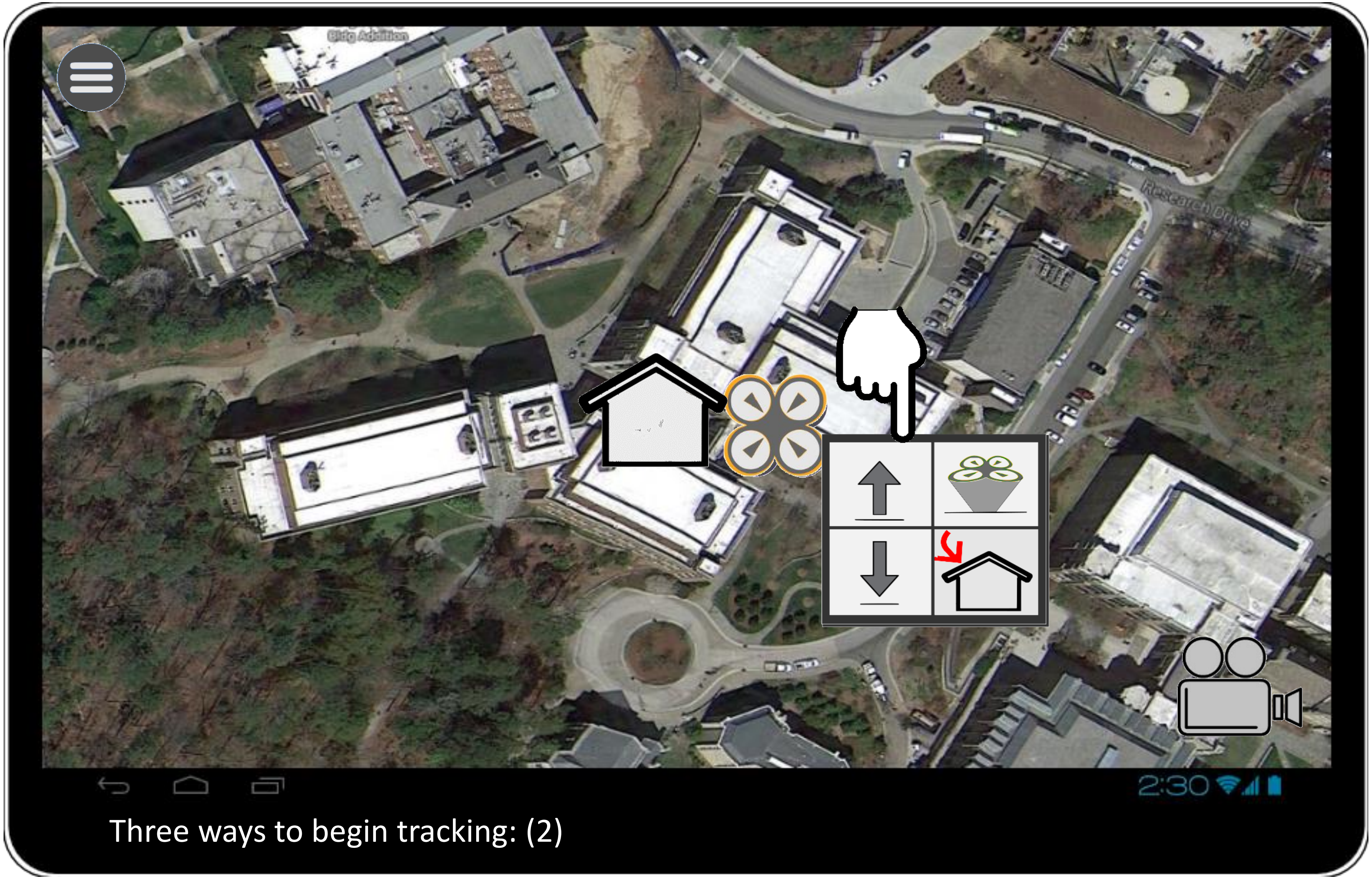
Three ways to begin tracking: (2)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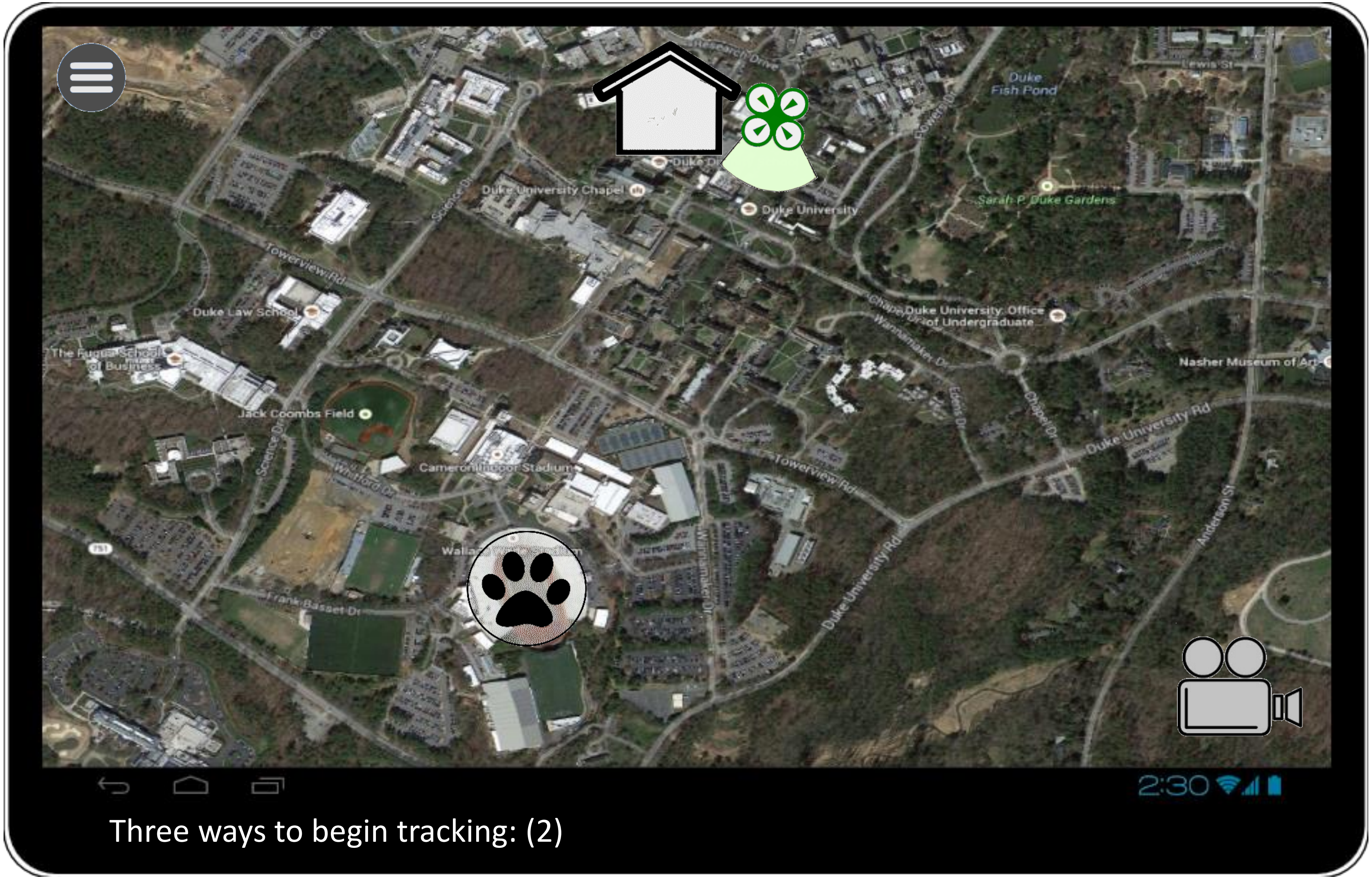
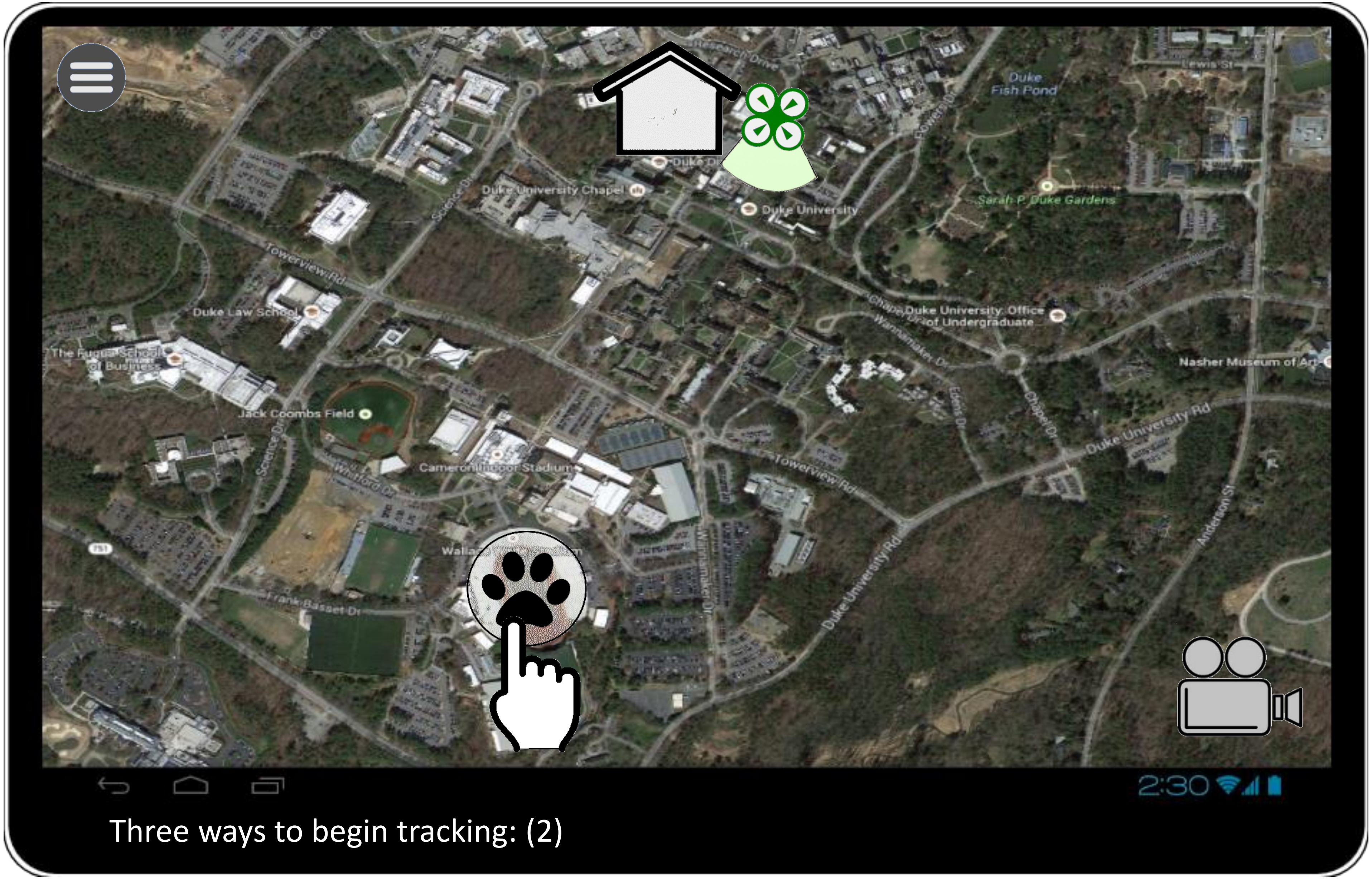

Research Drive
Duke Fish Pond
Lewis St
Duke University Chapel
Duke University
Sarah P. Duke Gardens
Towerview Rd
Duke Law School
The Fuqua School of Business
Duke University Office of Undergraduate
Nasher Museum of Art
Jack Coombs Field
Cameron Indoor Stadium
Whitford Dr
Science Dr
Duke University Rd
Towerview Rd
Frank Bassett Dr
Wannamaker Dr
Anderson St
Chapel Dr
2:30

Three ways to begin tracking: (2)


Research Drive
Lewis St
Duke Fish Pond
Duke University Chapel
Duke University
Sarah P. Duke Gardens
Towerview Rd
Science Dr
Duke Law School
The Fuqua School of Business
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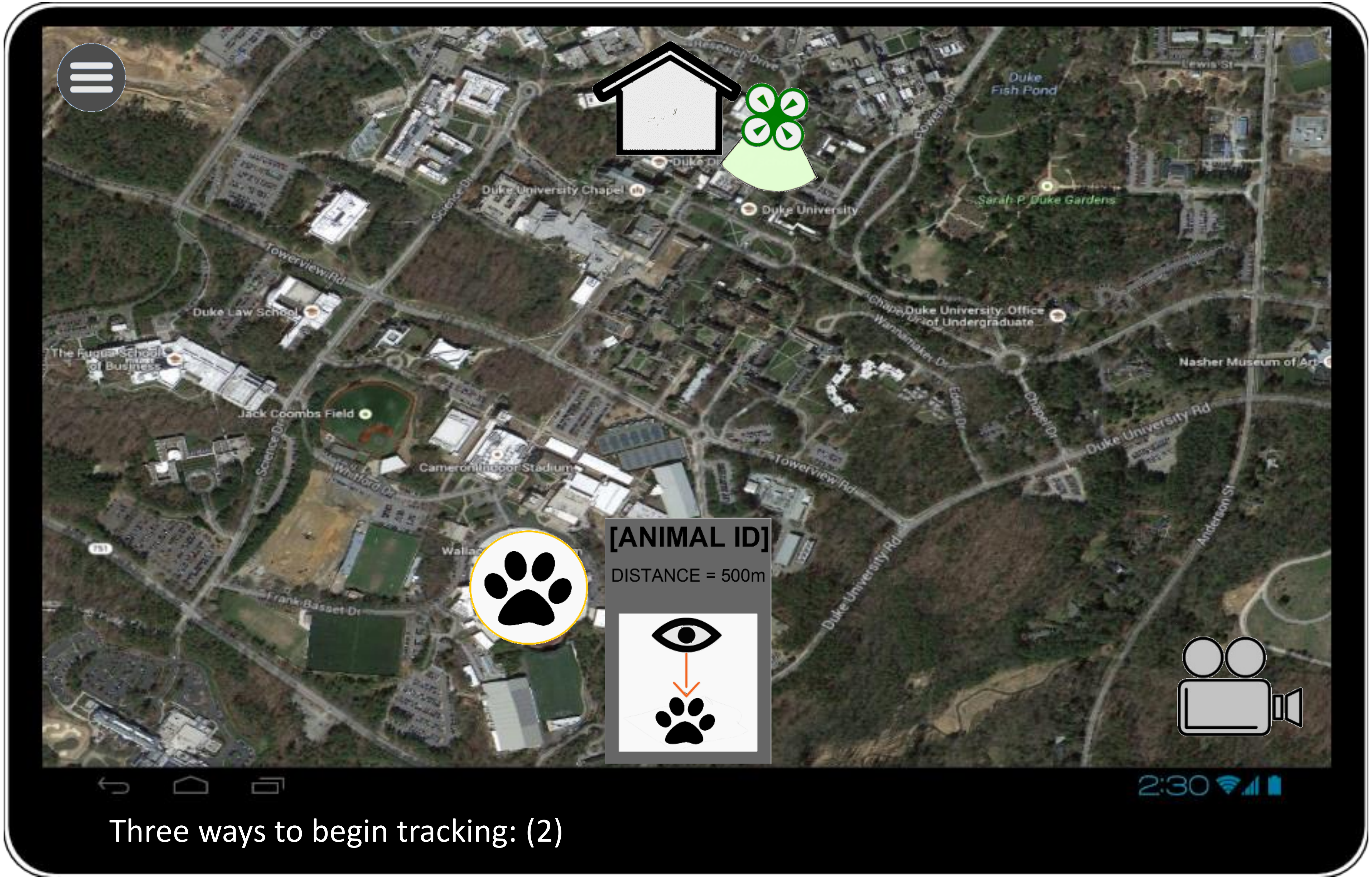
Jack Coombs Field
Cameron Indoor Stadium
Edens Dr
Duke University Rd
Whitford Dr
Towerview Rd
751
Frank Basset Dr
Wannamaker Dr
Duke University Rd
Anderson St
2:30

Three ways to begin tracking: (2)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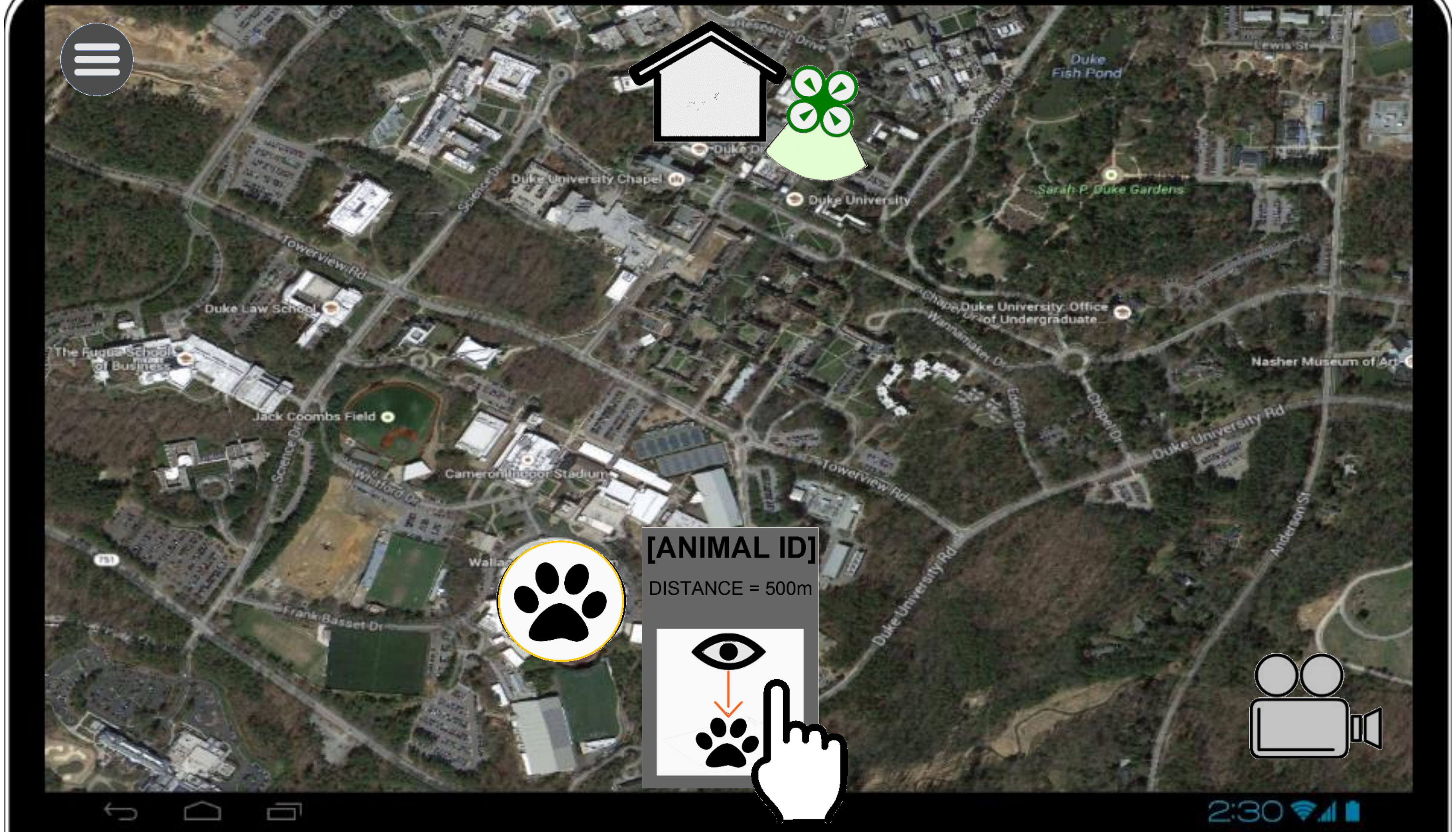
Duke Fish Pond
Lewis St
Duke University Chapel
Duke University
Sarah P. Duke Gardens
Towerview Rd
Duke Law School
The Fuqua School of Business
Jack Coombs Field
Cameron Indoor Stadium
Duke University Office of Undergraduate
Wannamaker Dr
Chapel Dr
Nasher Museum of Art
Duke University Rd
Whitford Dr
Science Dr
Frank Basset Dr
Anderson St
[ANIMAL ID]
DISTANCE = 500m
2:30

Three ways to begin tracking: (2)



Research Drive
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Lewis St
Duke University Chapel
Duke University
Sarah P. Duke Gardens
Towerview Rd
Duke Law School
Duke University Office of Undergraduate
The Fuqua School of Business
Nasher Museum of Art
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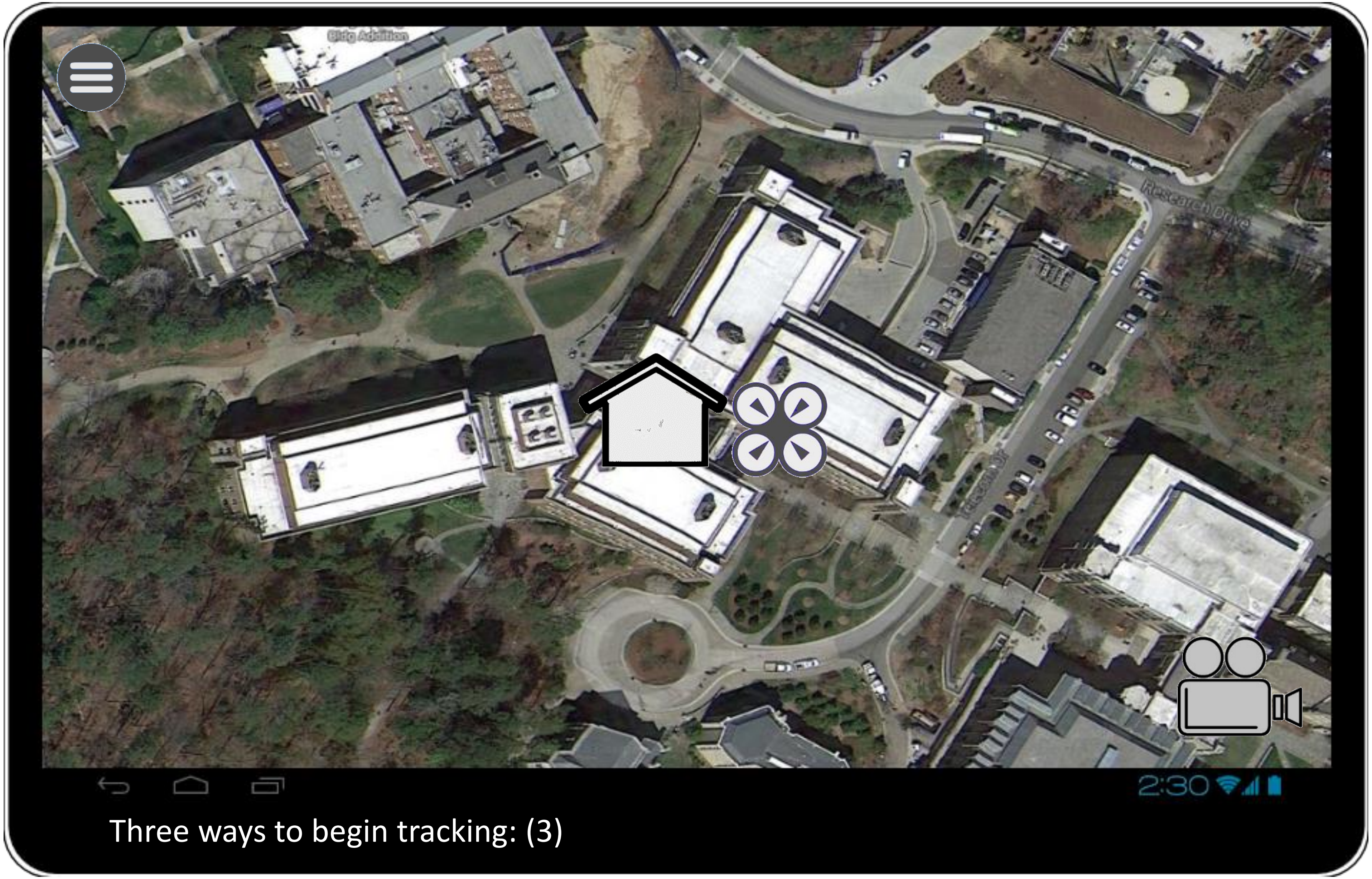
Science Dr
Whitford Dr
Chapel Dr
Wannamaker Dr
Duke University Rd
Anderson St
Frank Basset Dr
751
[ANIMAL ID]
DISTANCE = 500m
2:30

Three ways to begin tracking: (2)

OPTION 3

From Animal icon (in sidebar)


Bldg Addition
Research Drive
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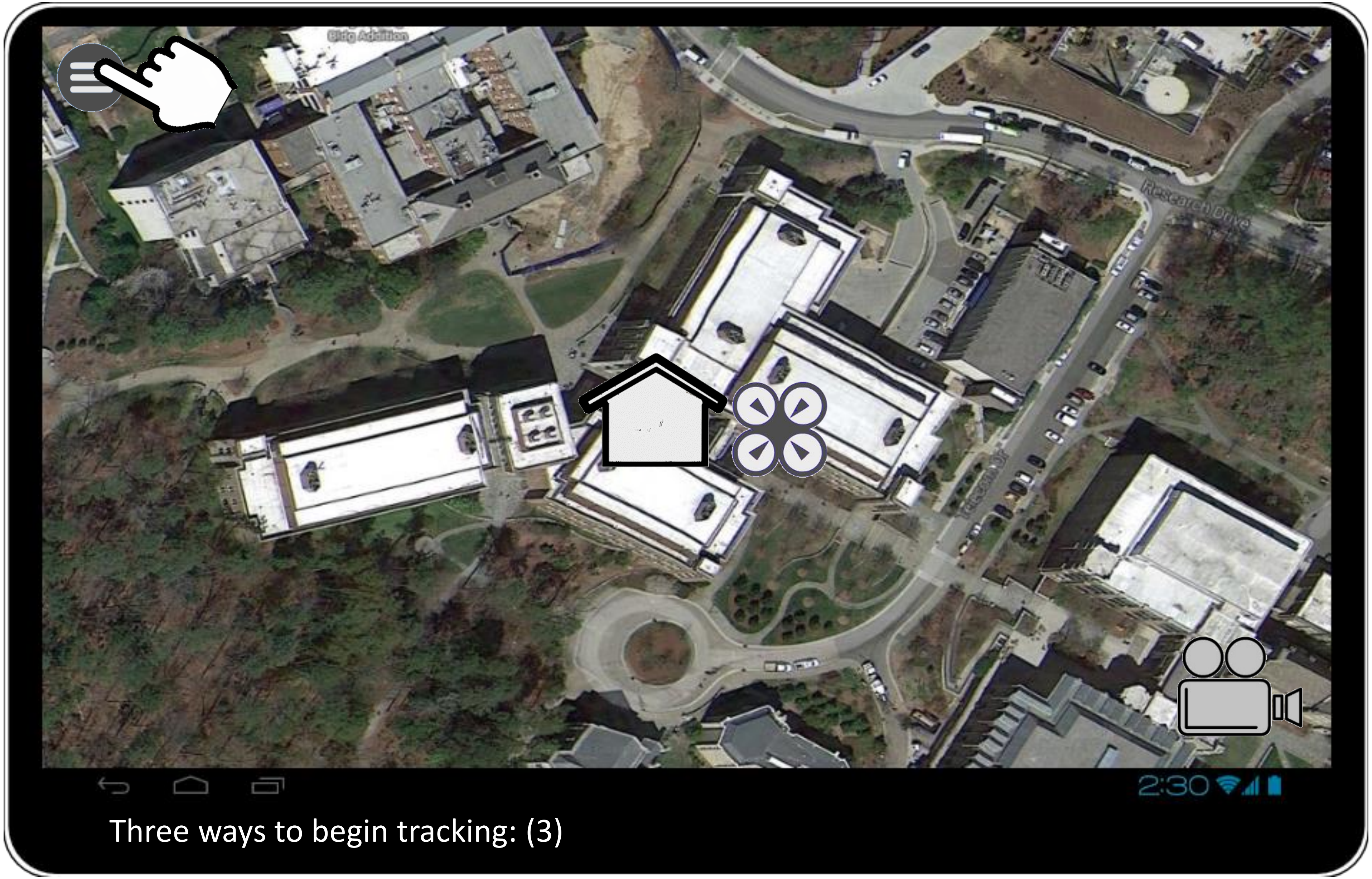
Three ways to begin tracking: (3)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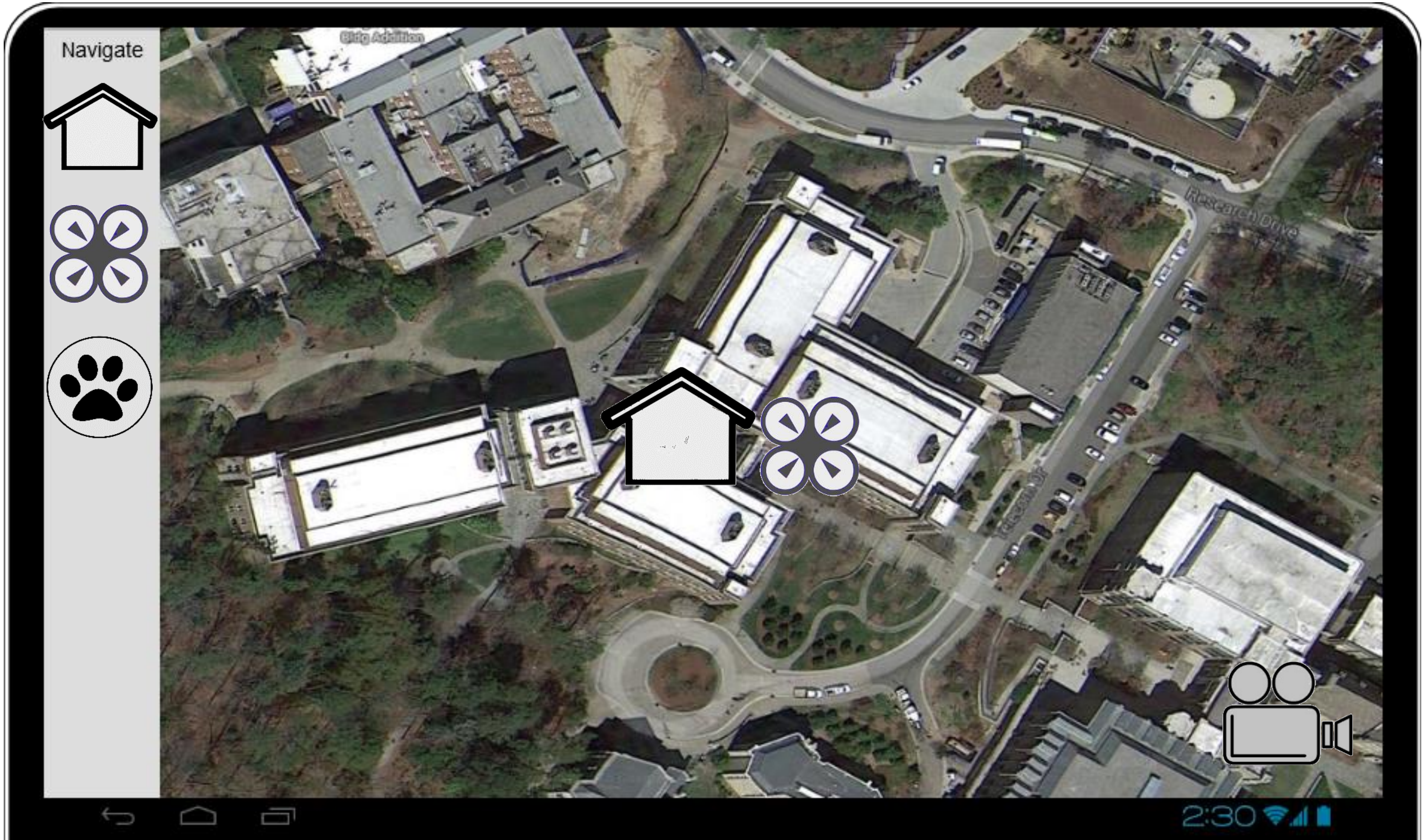
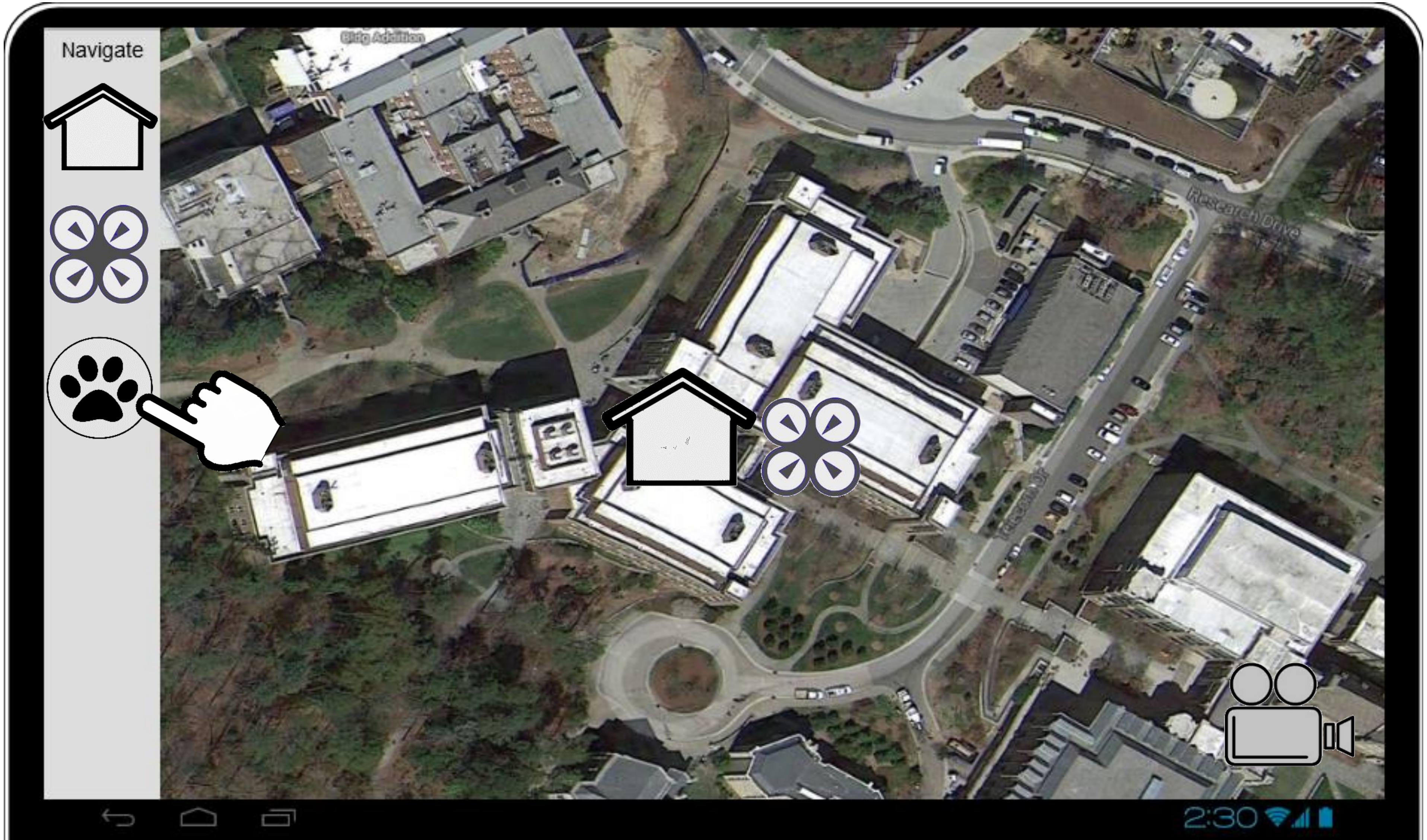
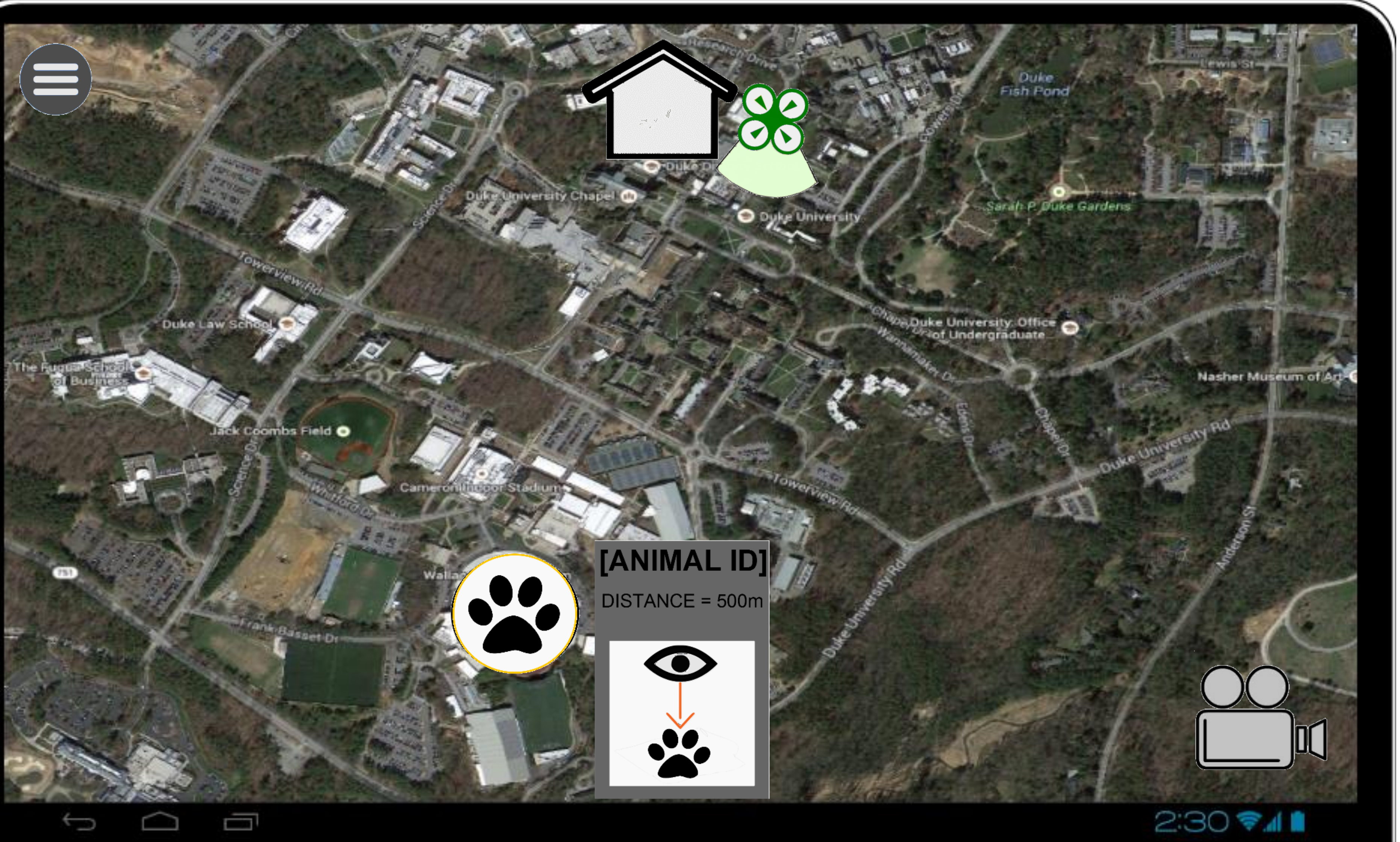

Navigate
Bldg Addition
Research Drive
2:30

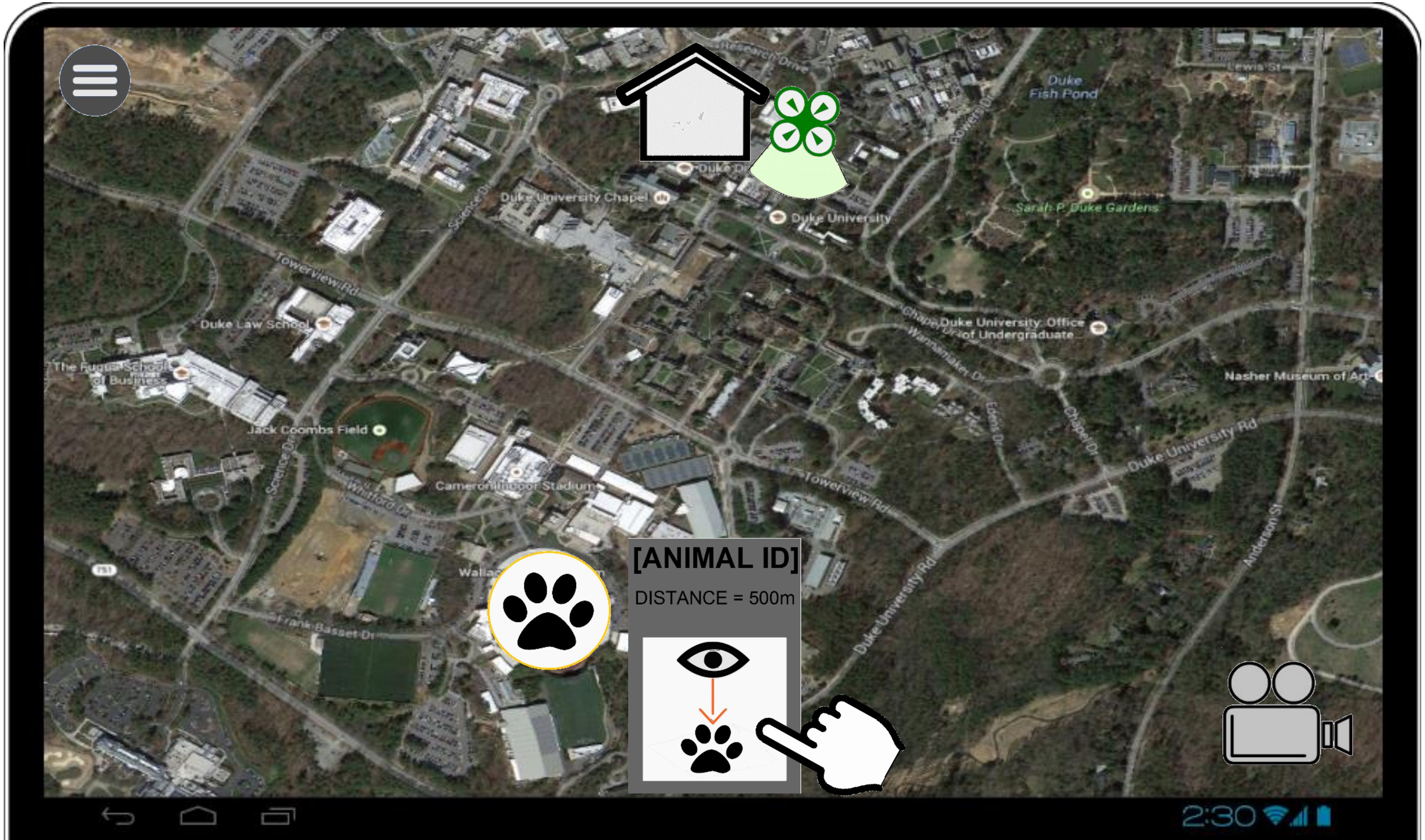
Three ways to begin tracking: (3)


Navigate
Bldg Addition
Research Drive
2:30

Three ways to begin tracking: (3)

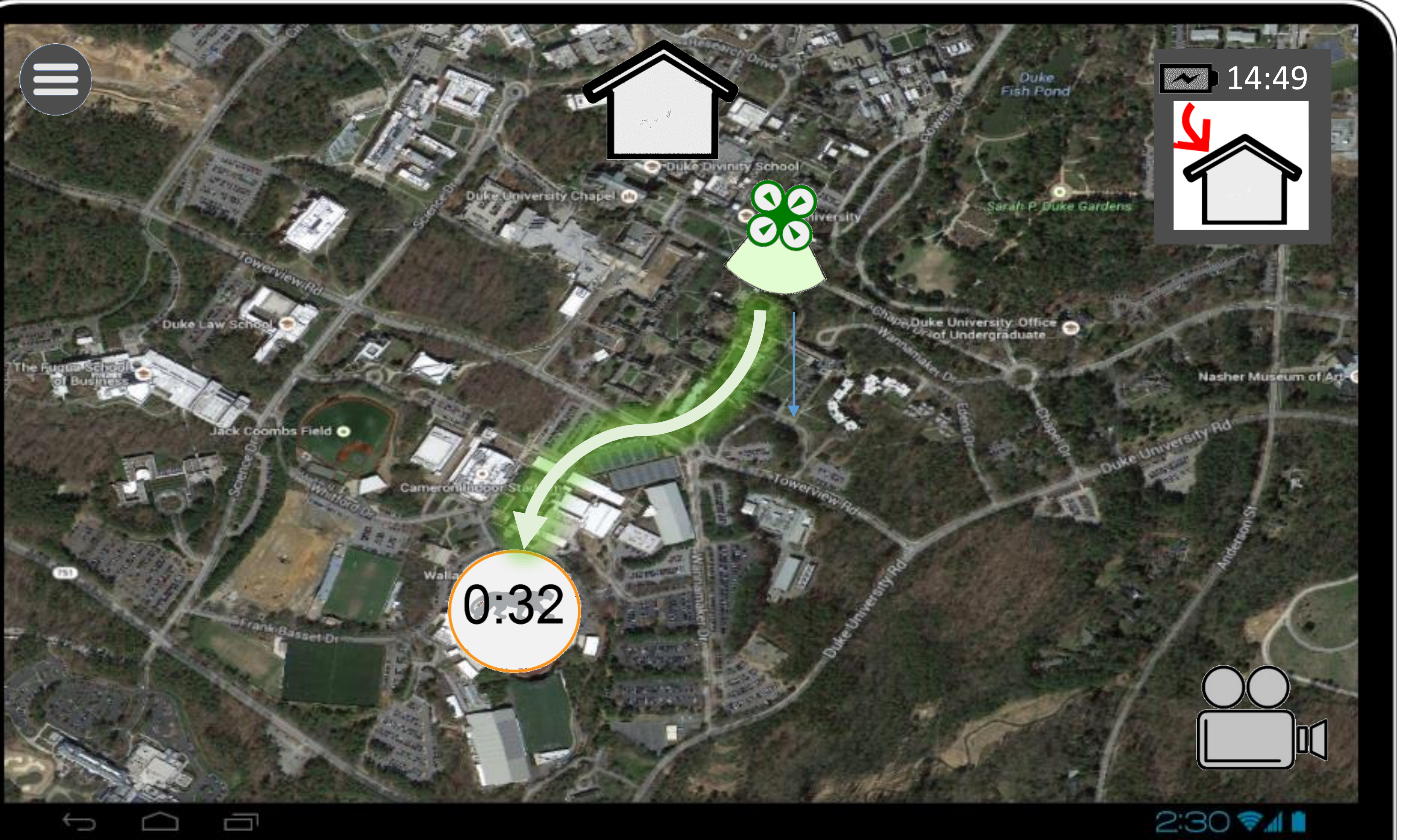

Research Drive
Duke Fish Pond
Lewis St
Sarah P. Duke Gardens
Duke University Chapel
Duke University
Science Dr
Towerview Rd
Duke Law School
The Fuqua School of Business
Chapel Dr
Duke University Office of Undergraduate
Wannamaker Dr
Nasher Museum of Art
Jack Coombs Field
Cameron Indoor Stadium
Whitford Dr
Edens Dr
Duke University Rd
Anderson St
Frank Basset Dr
[ANIMAL ID]
DISTANCE = 500m
2:30

Three ways to begin tracking: (3)


[ANIMAL ID]
DISTANCE = 500m
2:30

Three ways to begin tracking: (3)

CREATION OF ROUTE


14:49
Research Drive
Duke Divinity School
Duke University Chapel
University
Duke Fish Pond
Sarah P. Duke Gardens
Towerview Rd
Duke Law School
The Fuqua School of Business
Duke University Office of Undergraduate
Nasher Museum of Art
Jack Coombs Field
Cameron Indoor Stadium
Wannamaker Dr
Chapel Dr
Edens Dr
Duke University Rd
Science Dr
Whitford Dr
Frank Basset Dr
Anderson St
751
0:32
2:30

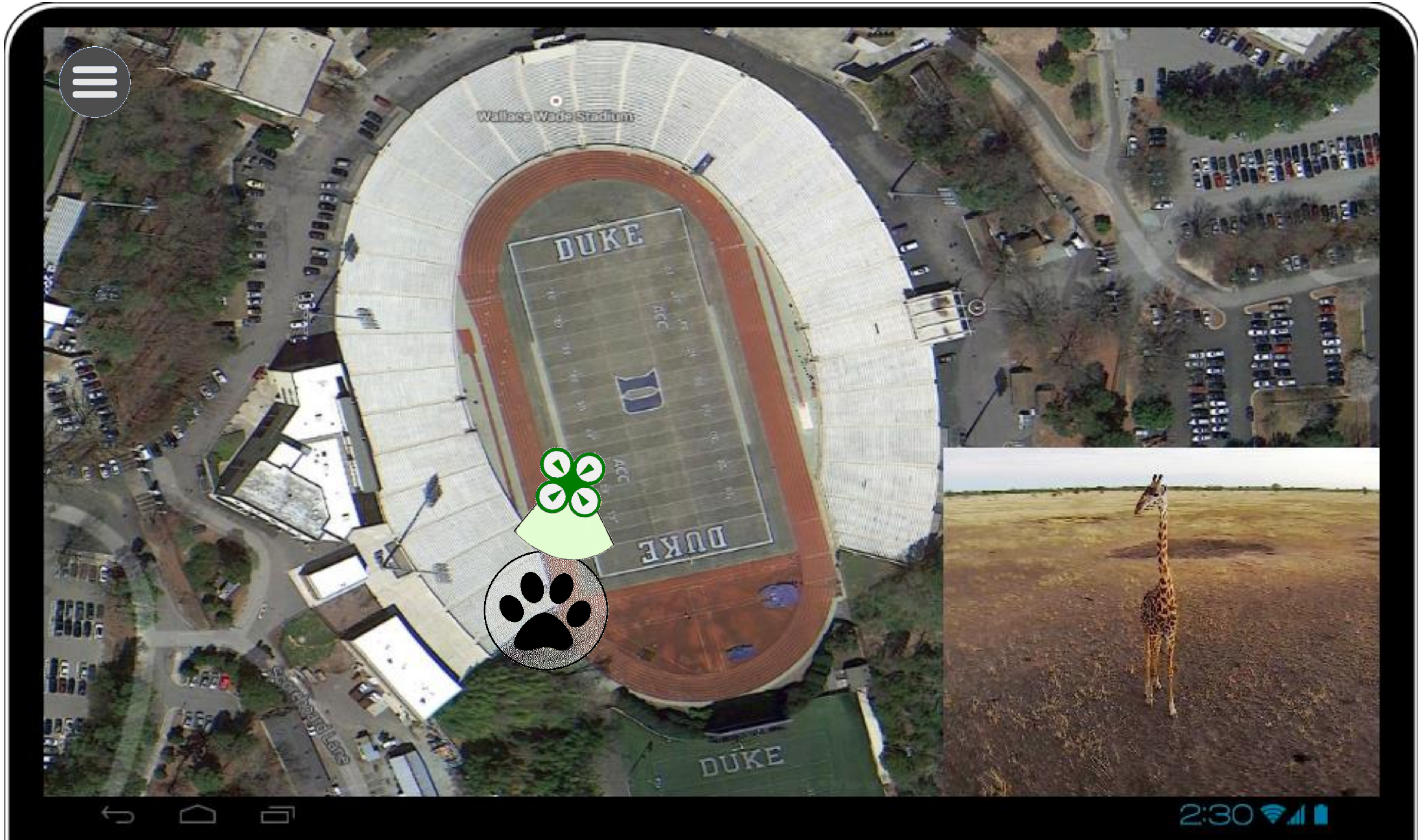
Countdown until need to return home

Shortest path calculated from GIS data and displayed.

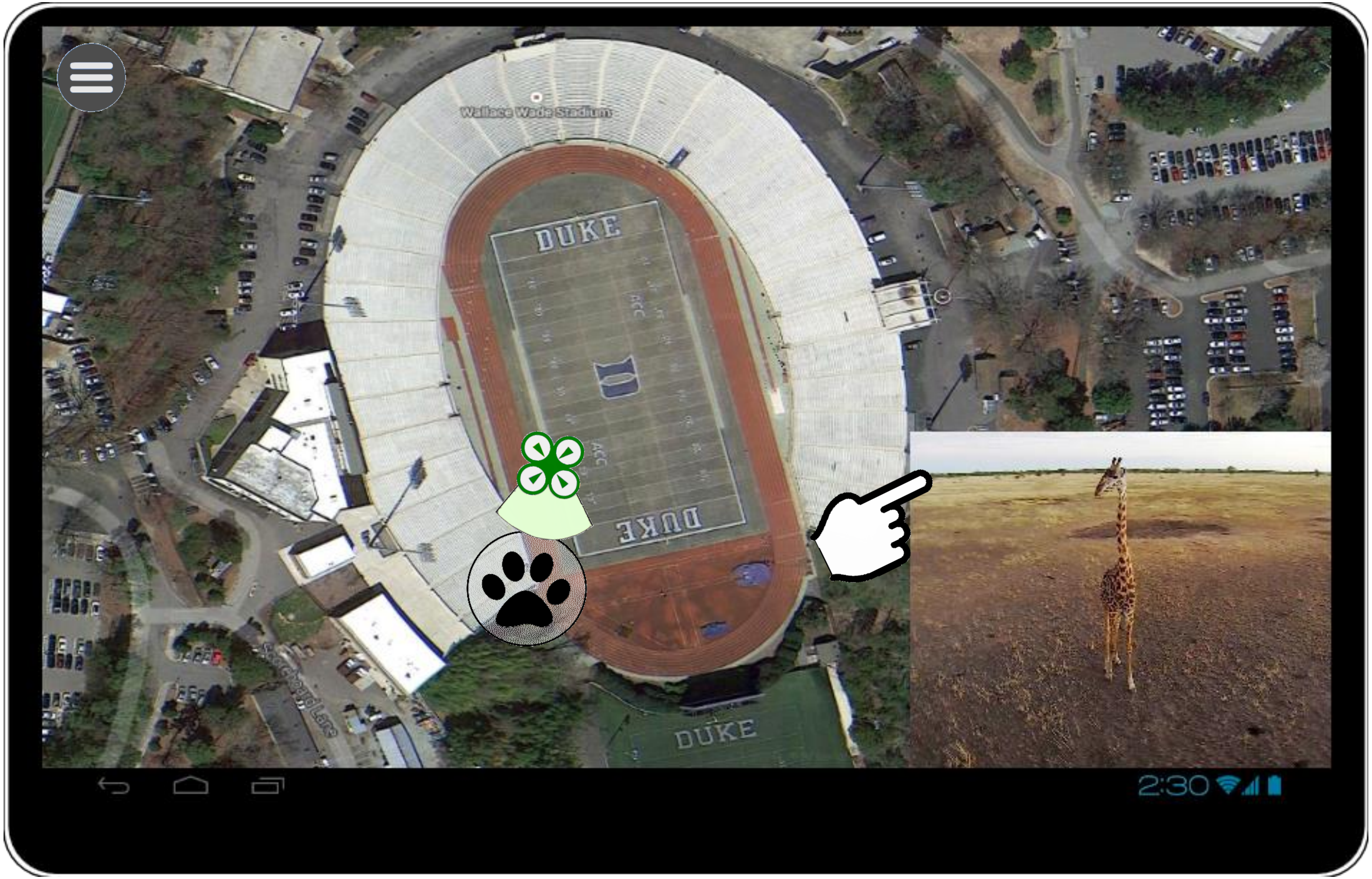
Timer appears at intervals

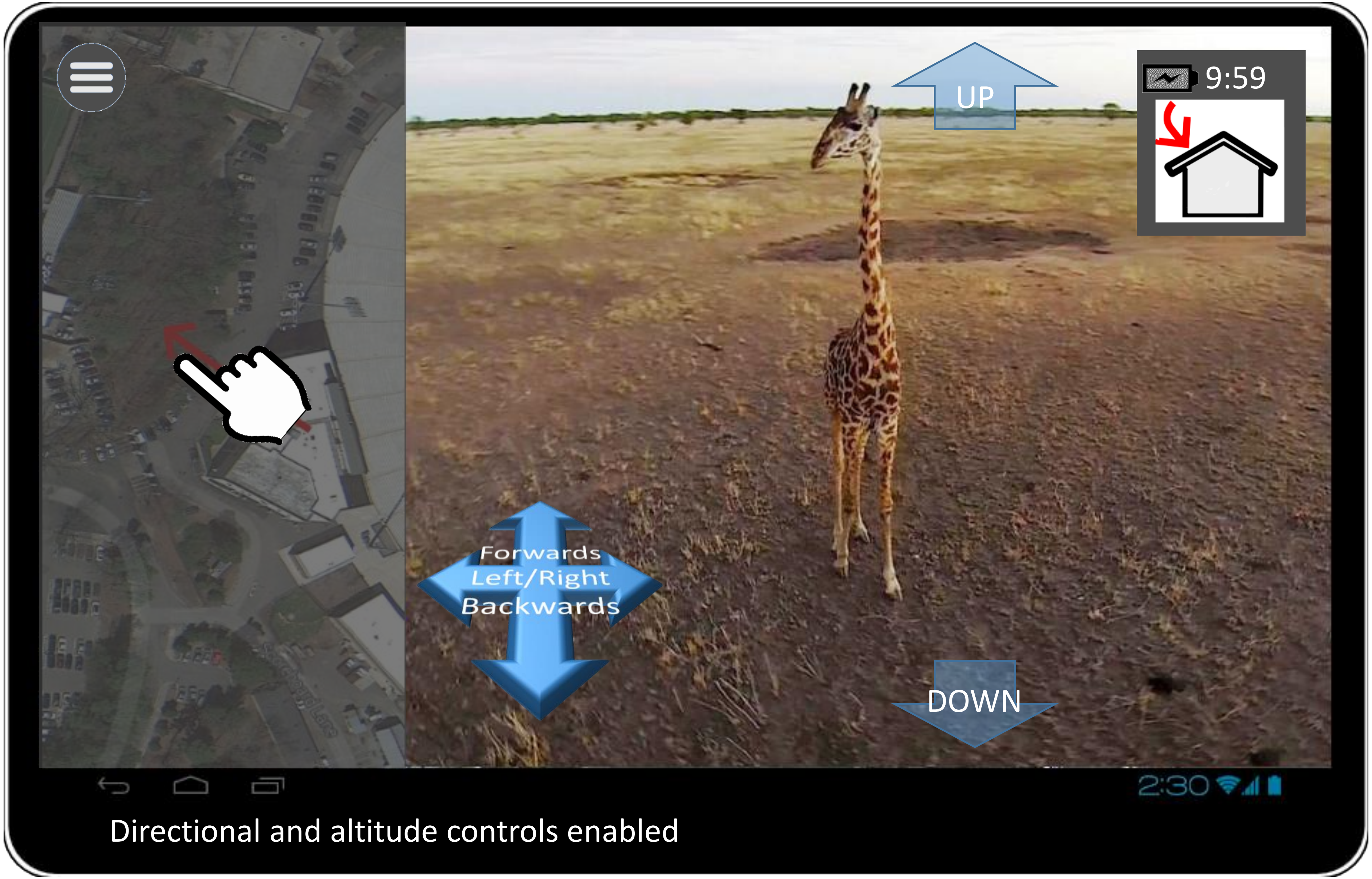
OPERATION - PROXIMITY OF ANIMAL

Video operation


Wallace Wade Stadium
DUKE
DUKE
DUKE
2:30

Video feed automatically displays when in range


Wallace Wade Stadium
DUKE
DUKE
DUKE
2:30

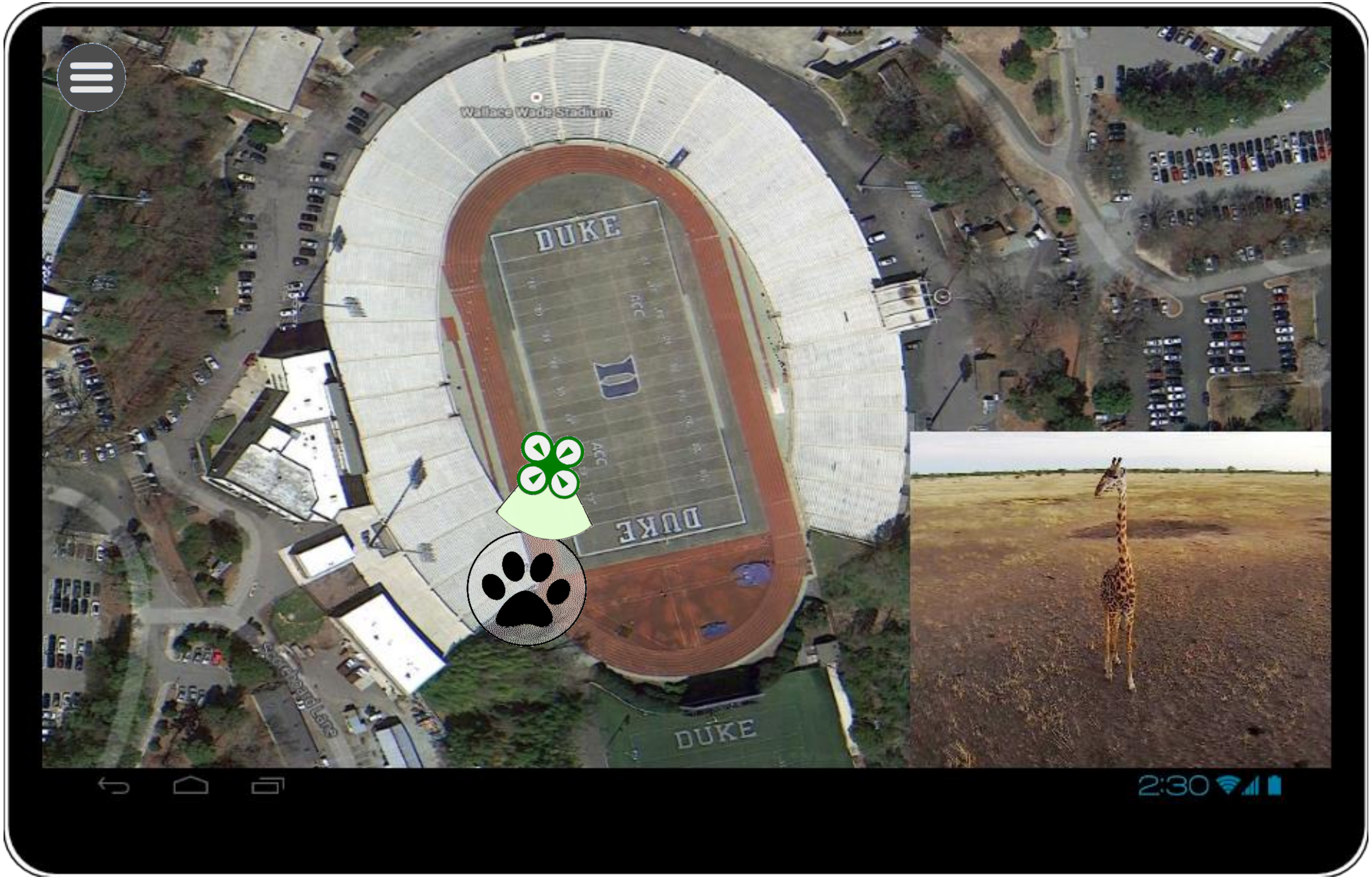

UP
9:59
Forwards
Left/Right
Backwards
DOWN
2:30

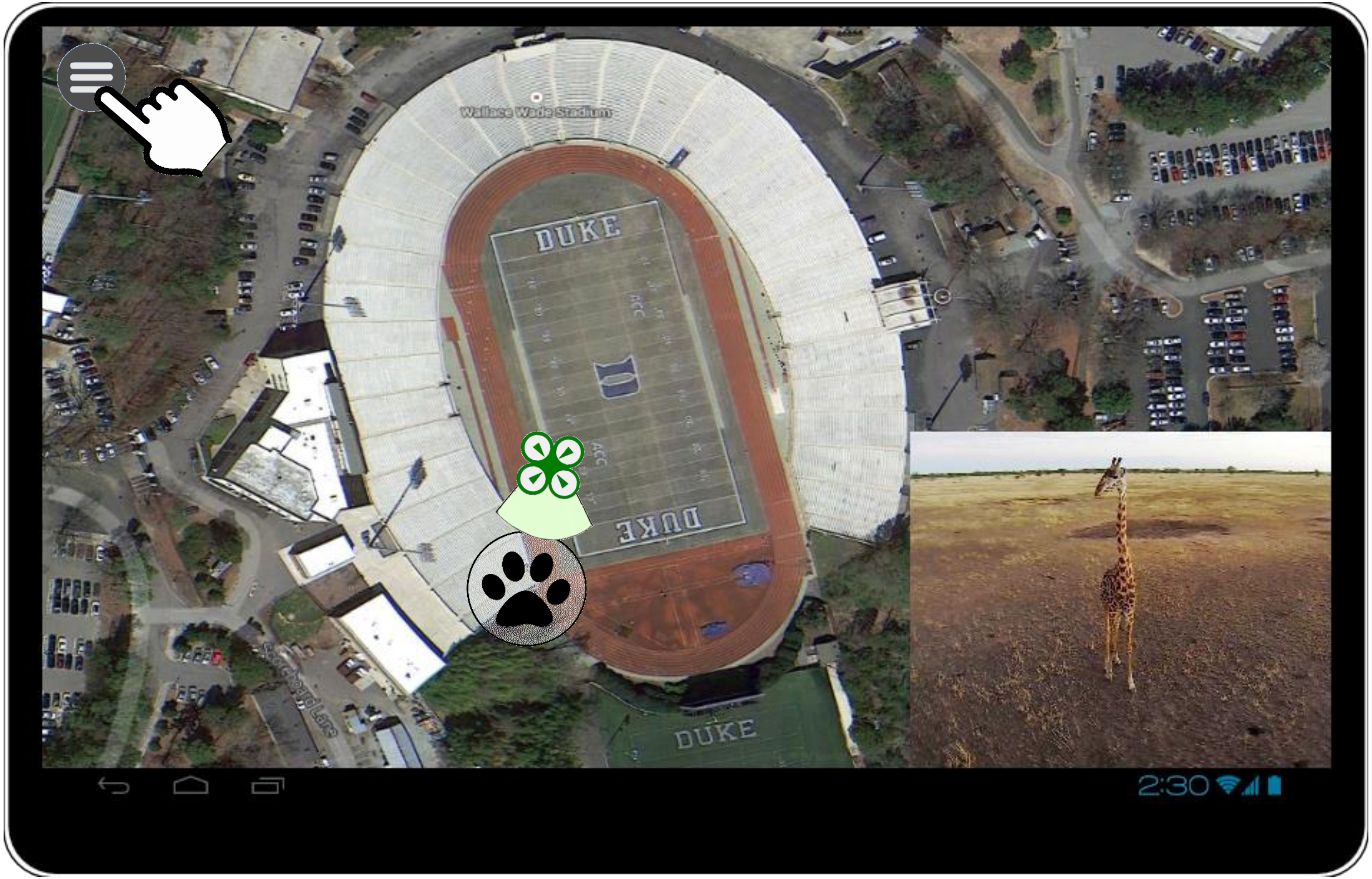
Directional and altitude controls enabled

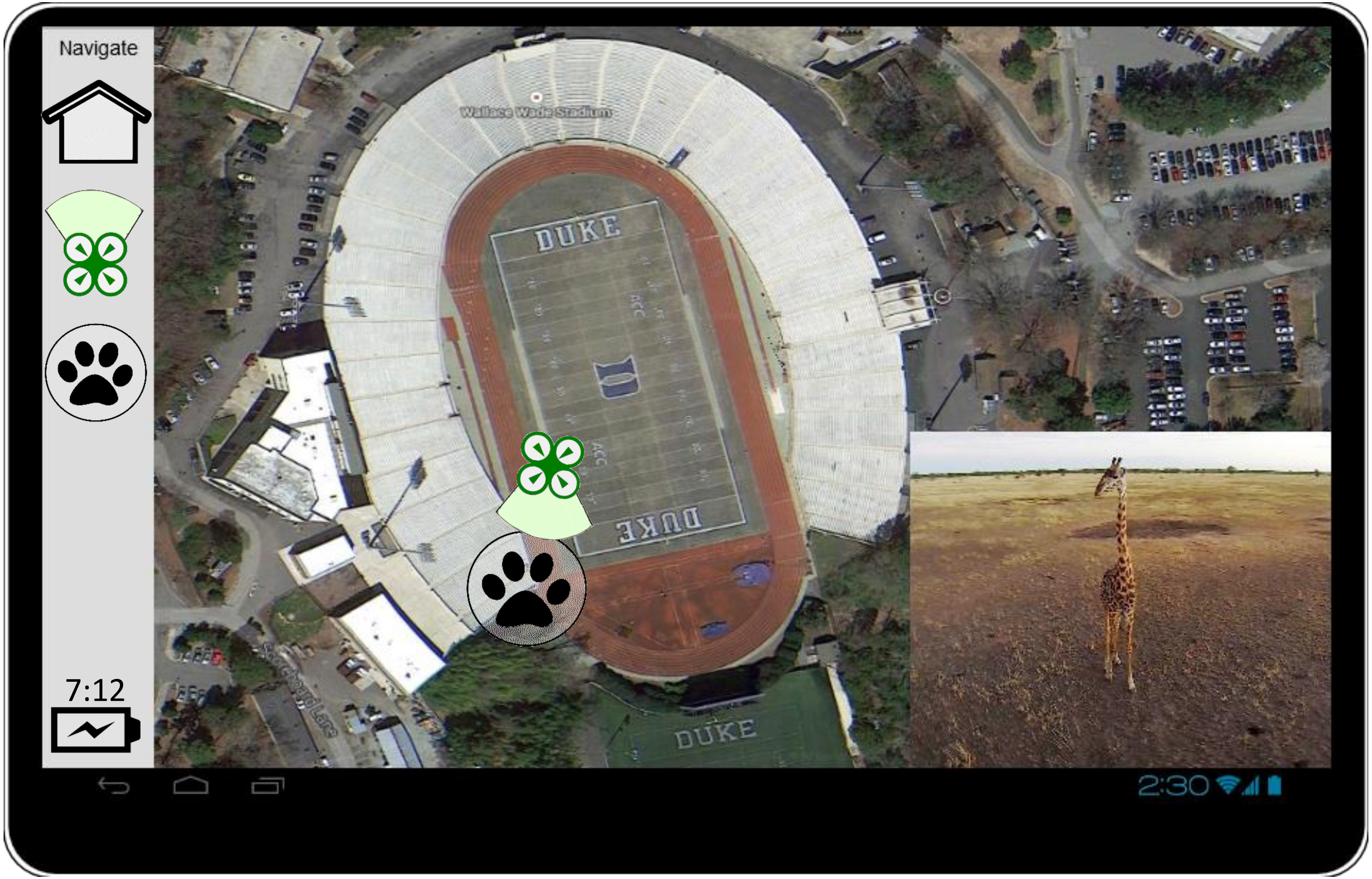
Return home button appears at select intervals

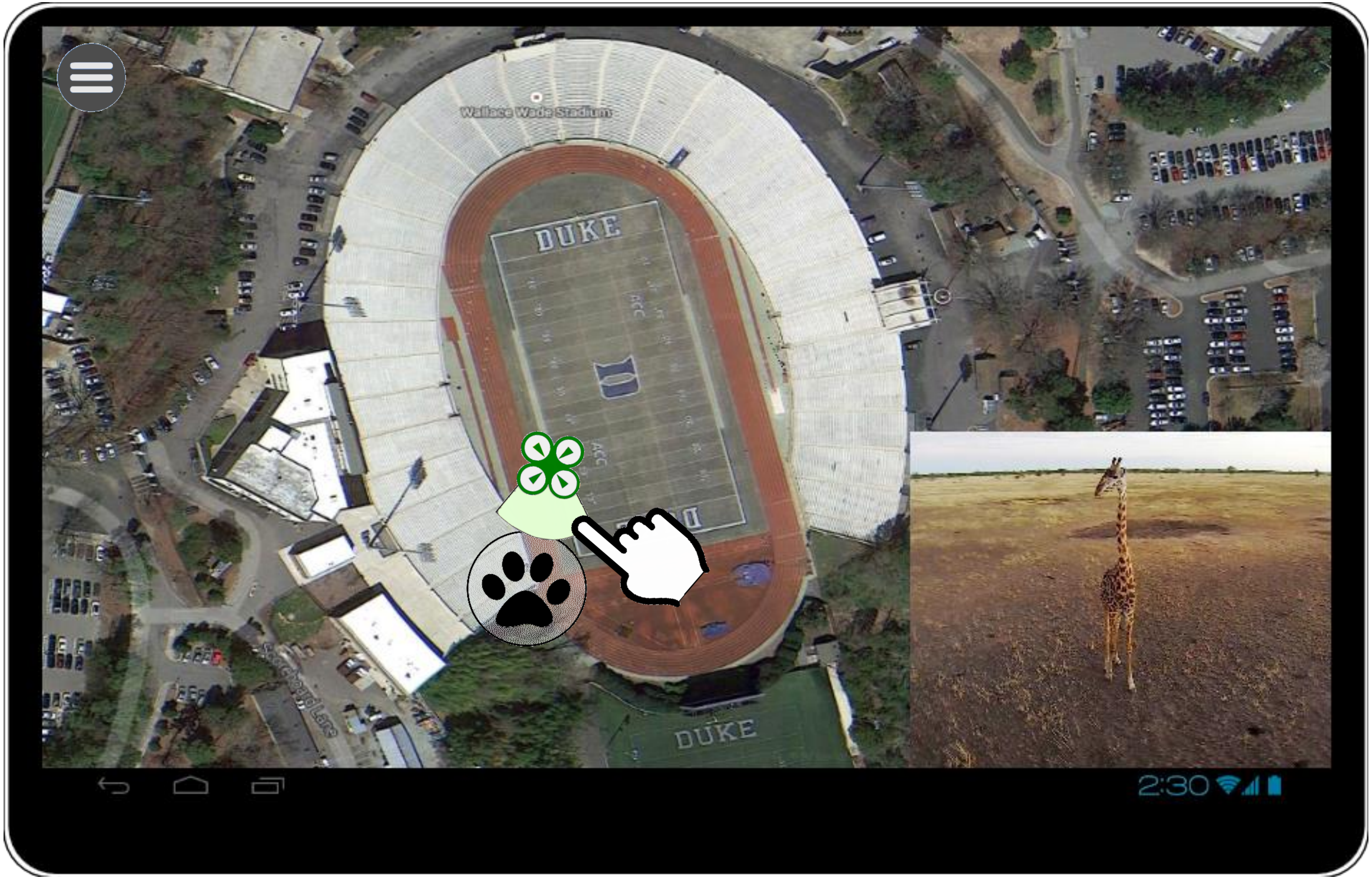
OPERATION - PROXIMITY OF ANIMAL

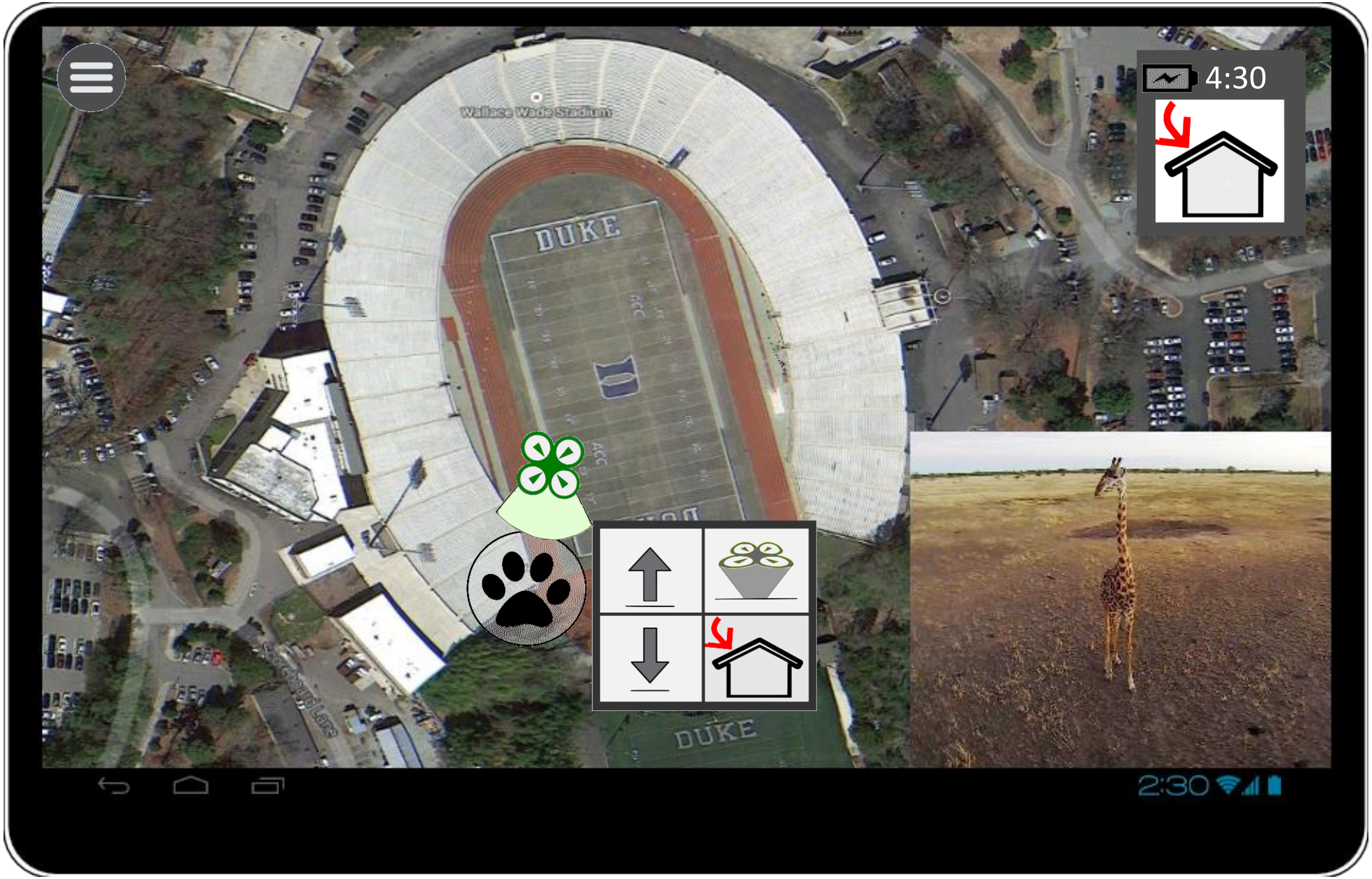
All menus accessible


Wallace Wade Stadium
DUKE
DUKE
DUKE
2:30


Wallace Wade Stadium
DUKE
DUKE
DUKE
2:30

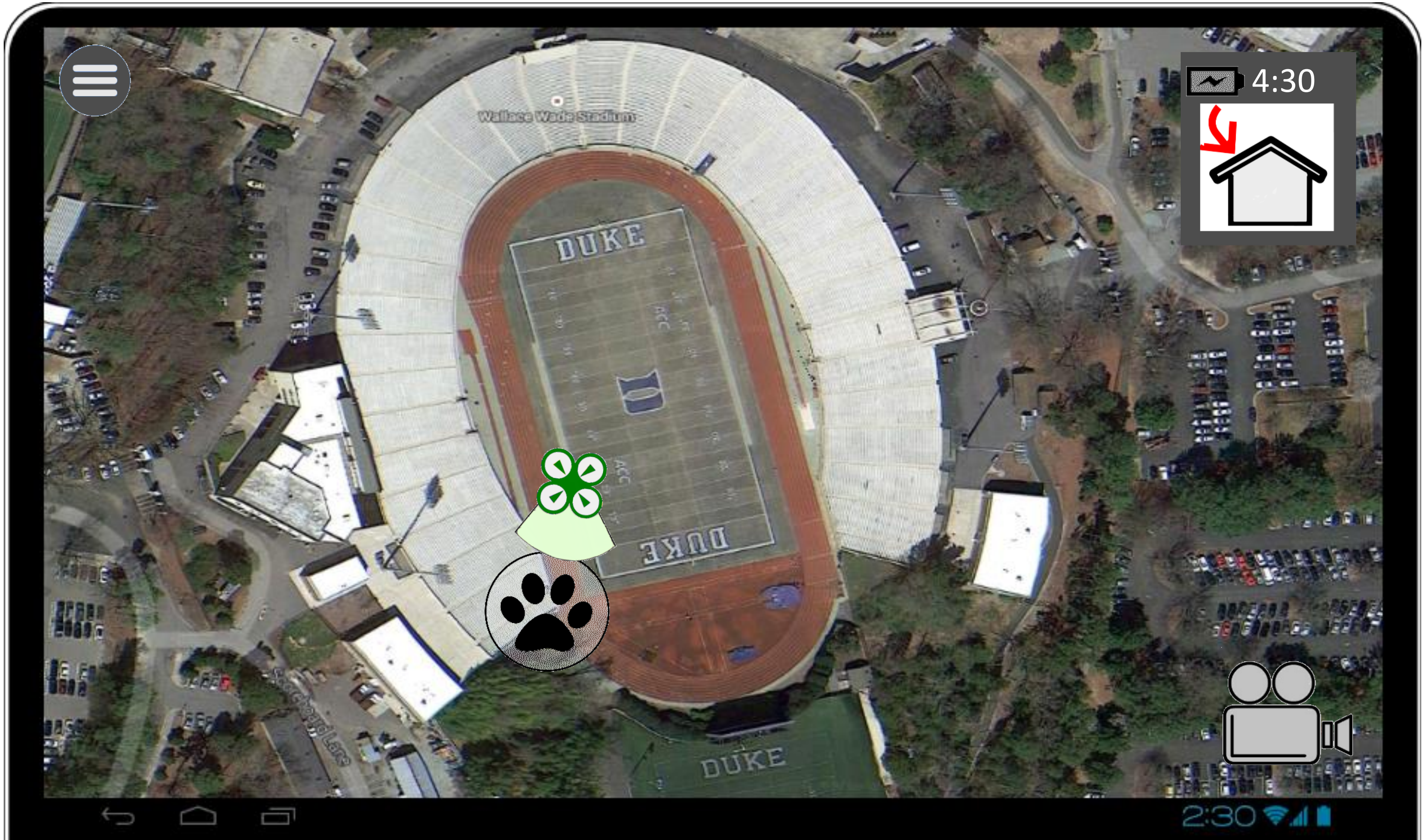

Navigate
7:12
Wallace Wade Stadium
DUKE
DUKE
DUKE
2:30


Wallace Wade Stadium
DUKE
DUKE
2:30

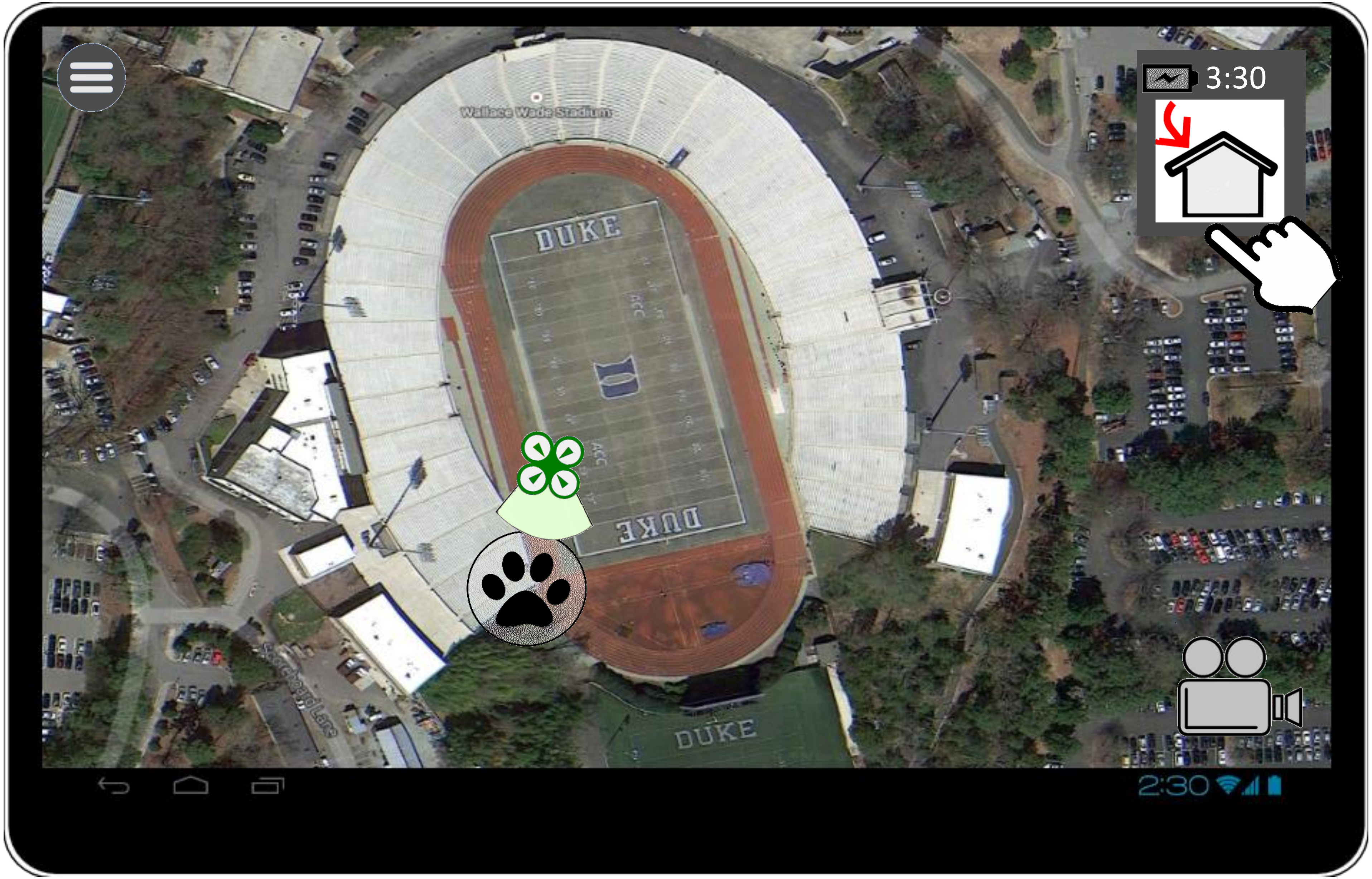

4:30
Wallace Wade Stadium
DUKE
DUKE
2:30

Return home button appears at select intervals

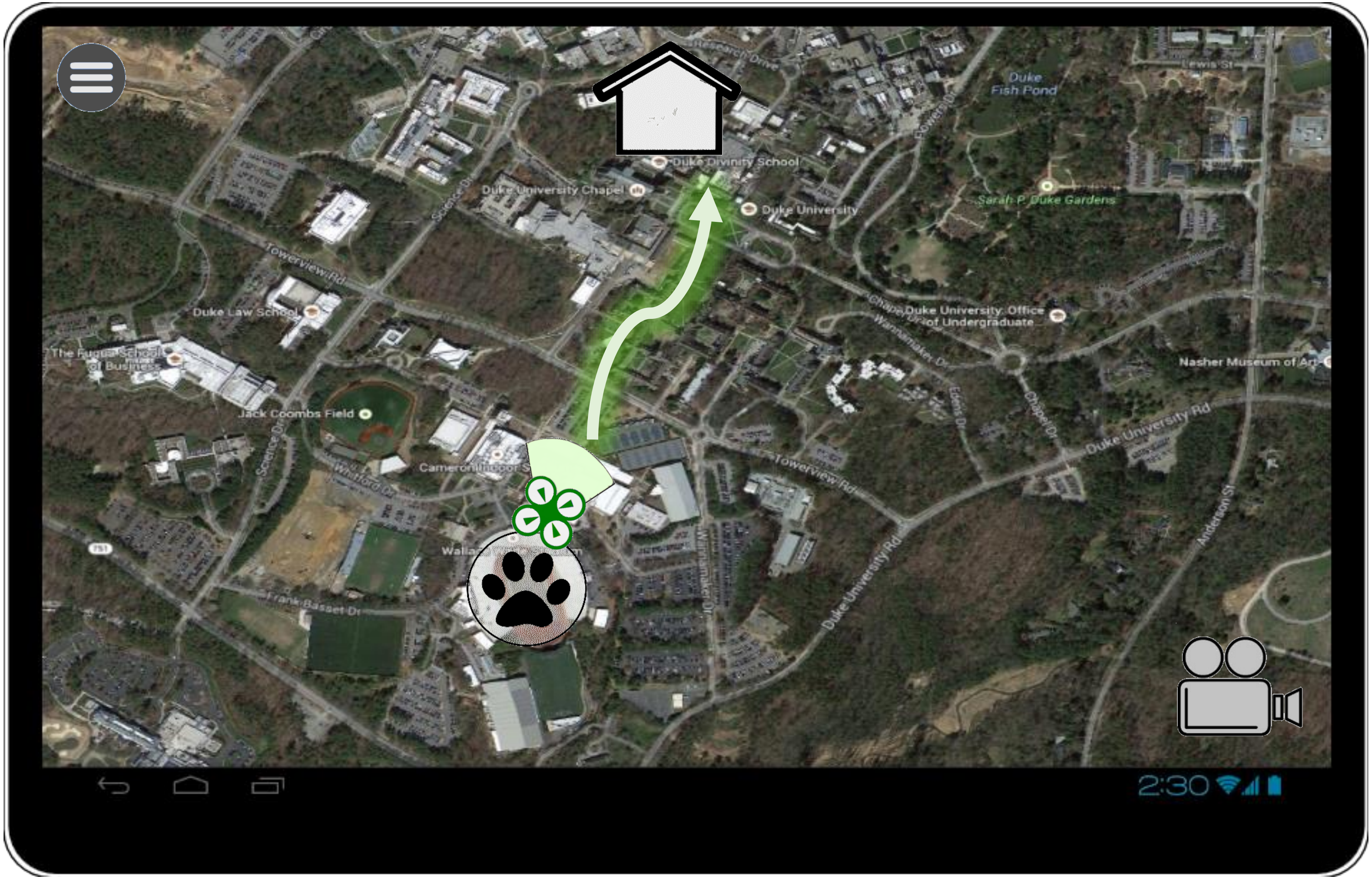
RETURNING HOME


Wallace Wade Stadium
4:30
DUKE
DUKE
DUKE
2:30

Option to return home flashes when return time calculated to 0:00


Wallace Wade Stadium
DUKE
DUKE
DUKE
3:30
2:30

Flashes
As time
Becomes
Critical


Research Drive
Duke Fish Pond
Lewis St
Duke Divinity School
Duke University Chapel
Duke University
Sarah P. Duke Gardens
Towerview Rd
Science Dr
Duke Law School
The Fuqua School of Business
Chapel Dr
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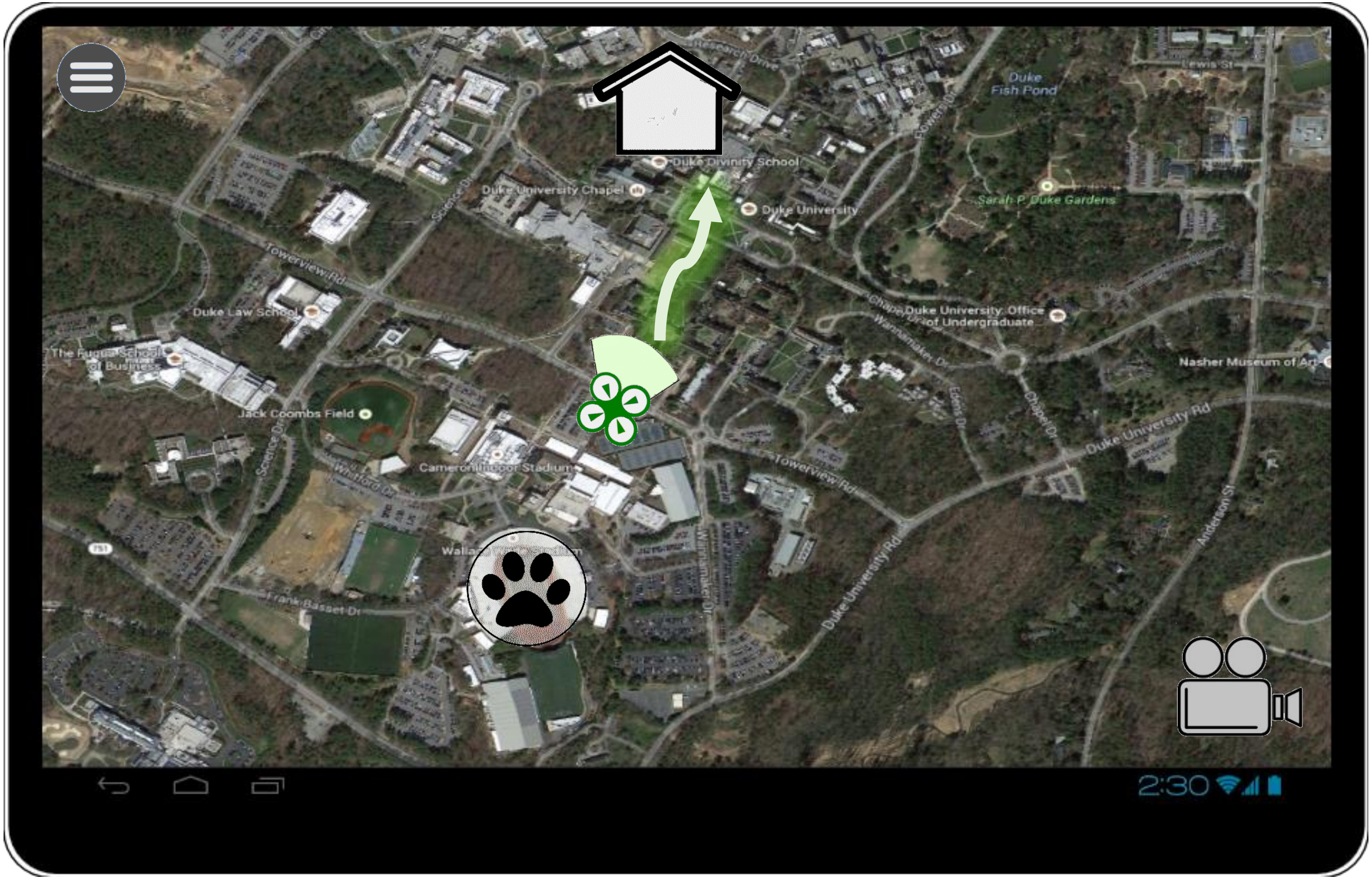
Cameron Indoor S
Whitford Dr
Edens Dr
Duke University Rd
Towerview Rd
Frank Basset Dr
751
Wannamaker Dr
Duke University Rd
Anderson St
2:30


Research Drive
Duke Divinity School
Duke University Chapel
Duke University
Duke Fish Pond
Lewis St
Powers Dr
Sarah P. Duke Gardens
Science Dr
Towerview Rd
Duke Law School
The Fuqua School of Business
Duke University Office of Undergraduate
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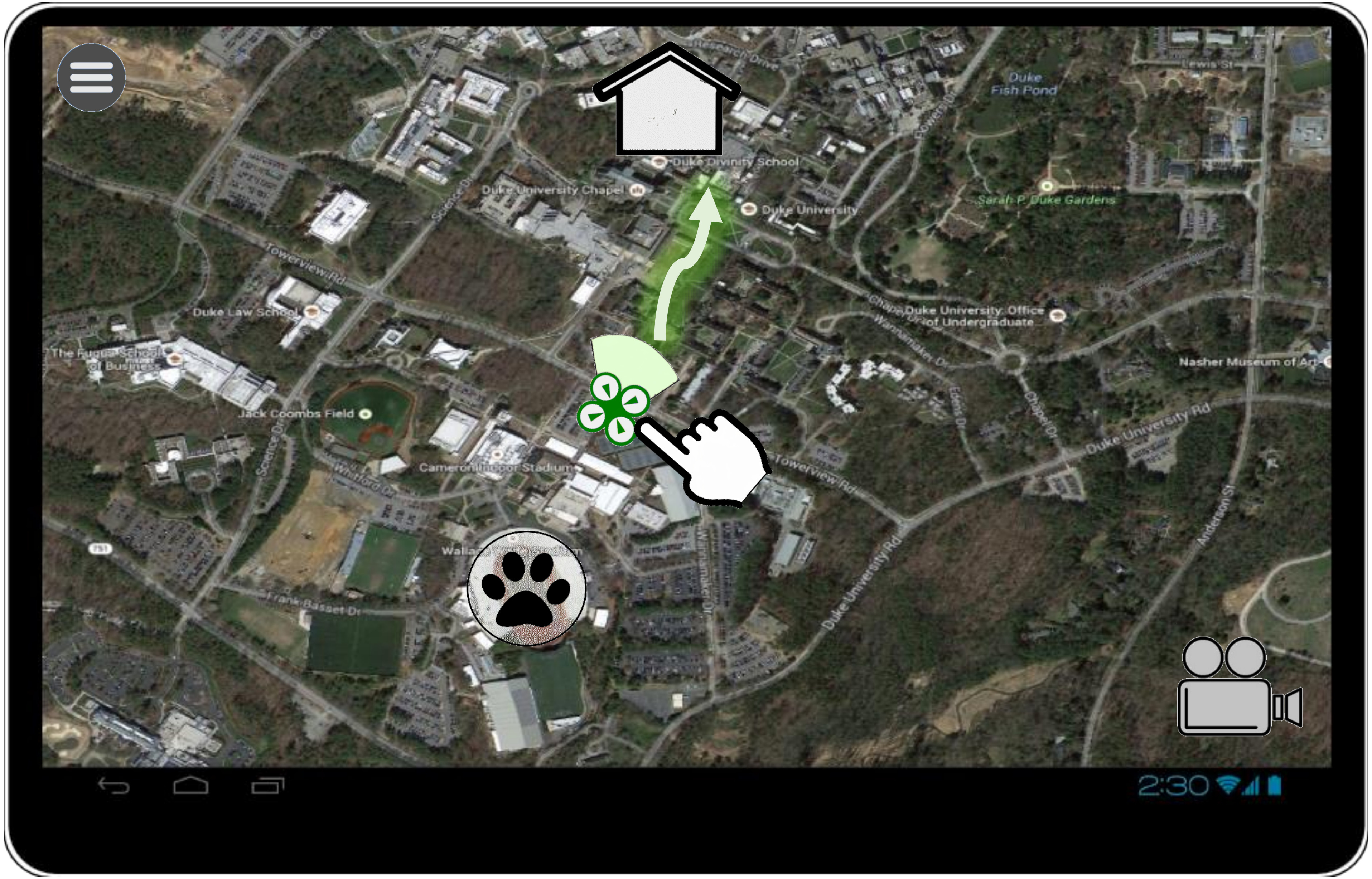
Jack Coombs Field
Edens Dr
Chapel Dr
Duke University Rd
Science Dr
Whitford Dr
Cameron Indoor Stadium
Towerview Rd
751
Wallace Wade Stadium
Wannamaker Dr
Duke University Rd
Anderson St
Frank Basset Dr
2:30

LOITER CONTROL

(Always Accessible, *Including In-Flight*)


Research Drive
Duke Fish Pond
Lewis St
Duke Divinity School
Duke University Chapel
Duke University
Sarah P. Duke Gardens
Towerview Rd
Science Dr
Duke Law School
Duke University Office of Undergraduate
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Edens Dr
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Cameron Indoor Stadium
Whitford Dr
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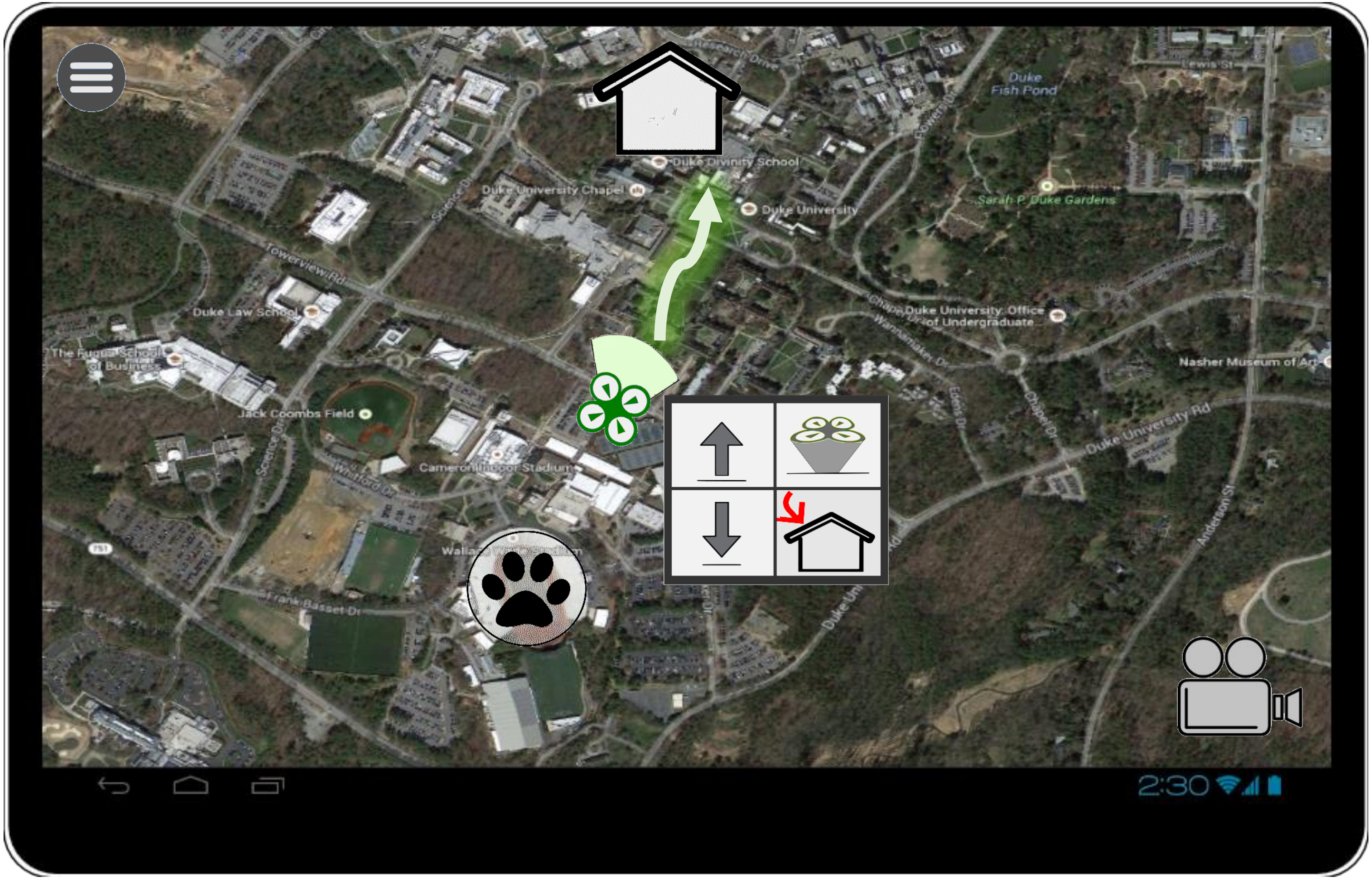
Frank Basset Dr
Wannamaker Dr
2:30


Research Drive
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Duke Divinity School
Duke University Chapel
Duke University
Sarah P. Duke Gardens
Science Dr
Towerview Rd
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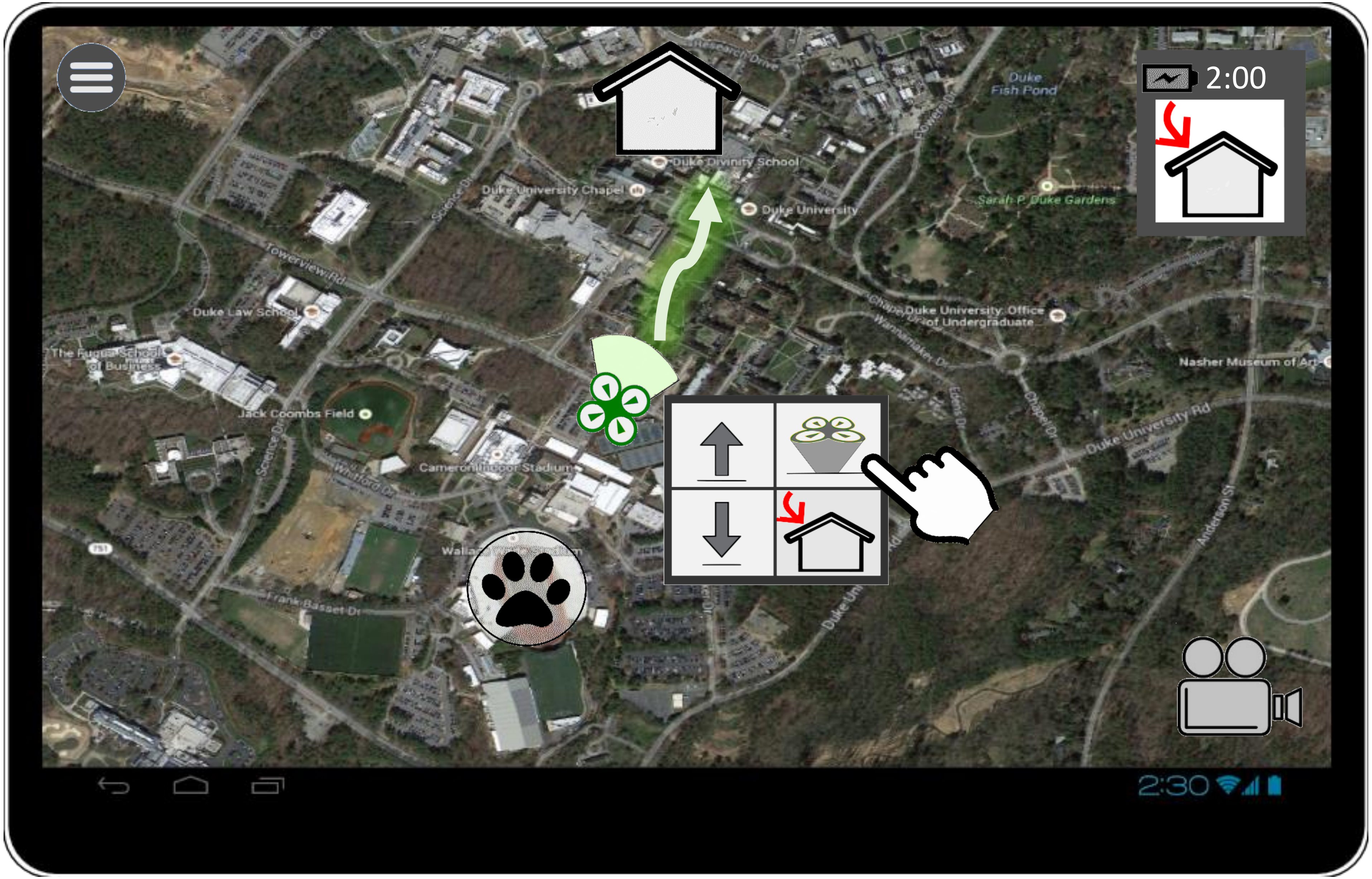
751
Frank Basset Dr
Anderson St
2:30


2:00
Duke Divinity School
Duke University Chapel
Duke University
Duke Fish Pond
Sarah P. Duke Gardens
Research Drive
Towerview Rd
Duke Law School
The Fuqua School of Business
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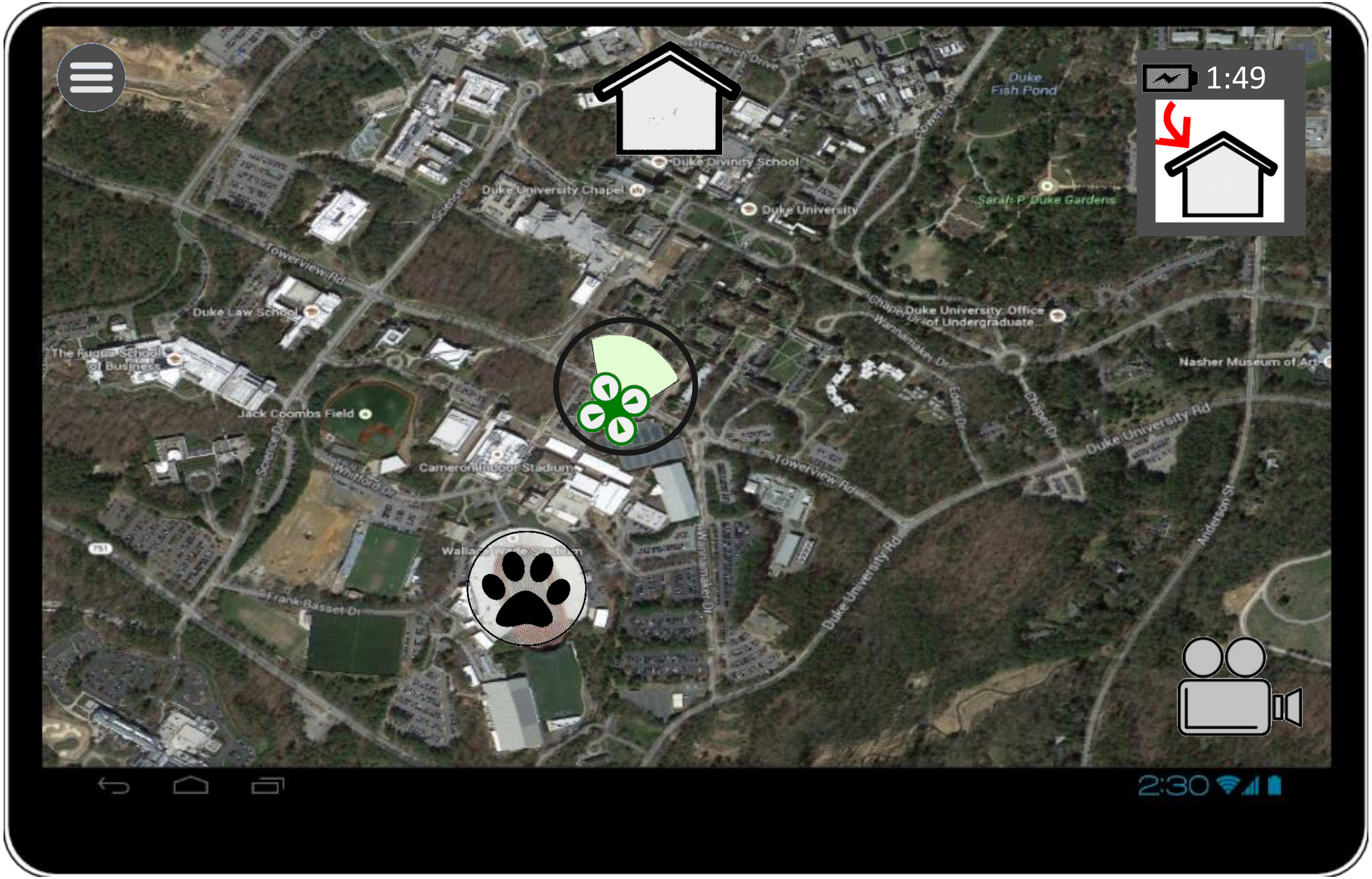
Science Dr
Chapel Dr
Anderson St
2:30


1:49
Research Drive
Duke Divinity School
Duke University Chapel
Duke University
Duke Fish Pond
Sarah P. Duke Gardens
Towerview Rd
Duke Law School
The Fuqua School of Business
Duke University Office of Undergraduate
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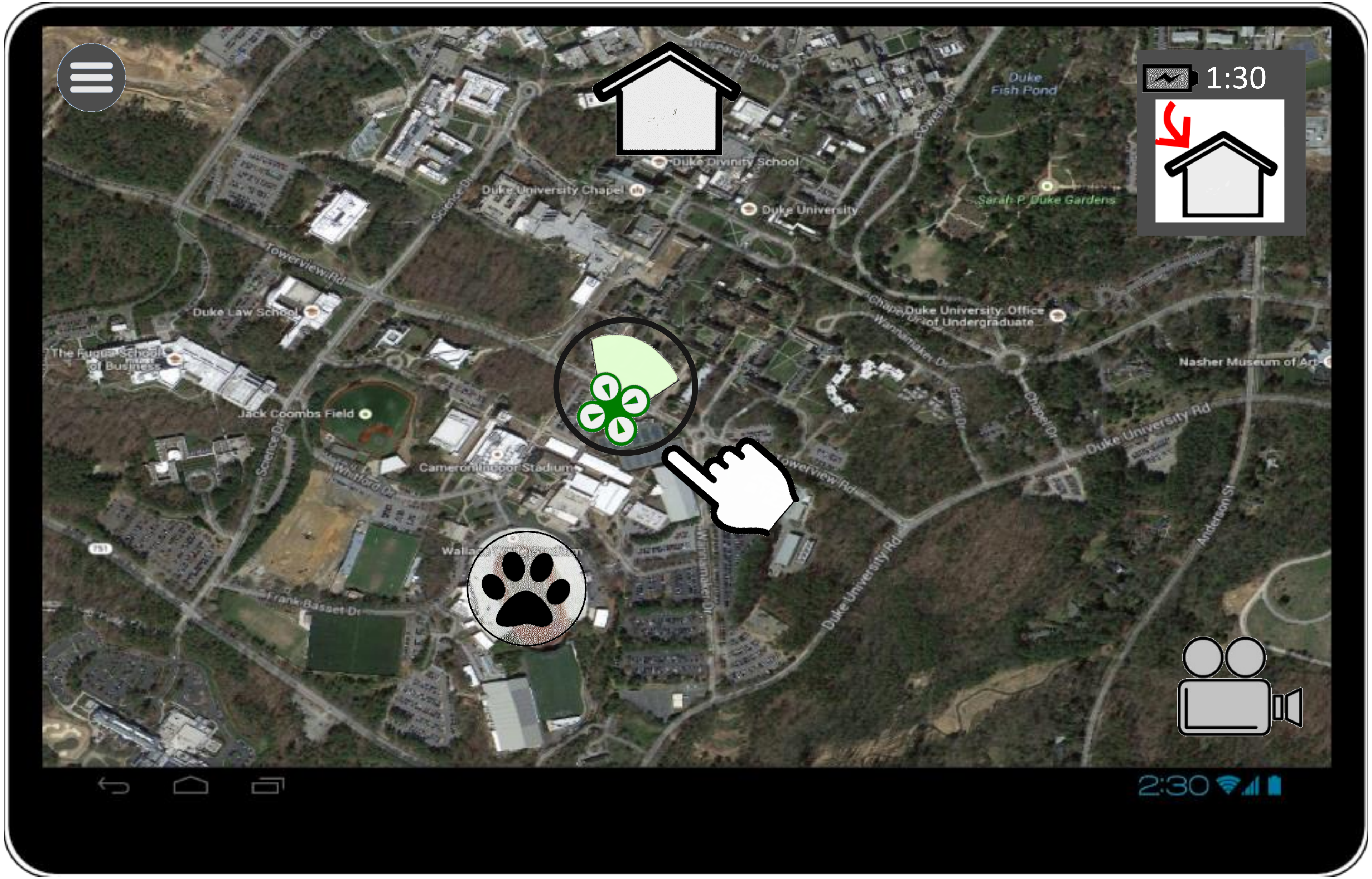
Edens Dr
Duke University Rd
Cameron Indoor Stadium
Towerview Rd
Science Dr
Whitford Dr
751
Frank Basset Dr
Wannamaker Dr
Duke University Rd
Anderson St
2:30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Duke University
Duke Fish Pond
Sarah P. Duke Gardens
Towerview Rd
Duke Law School
The Fuqua School of Business
Jack Coombs Field
Cameron Indoor Stadium
Duke University Office of Undergraduate
Nasher Museum of Art
Duke University Rd
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Edens Dr
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Science Dr
Whitford Dr
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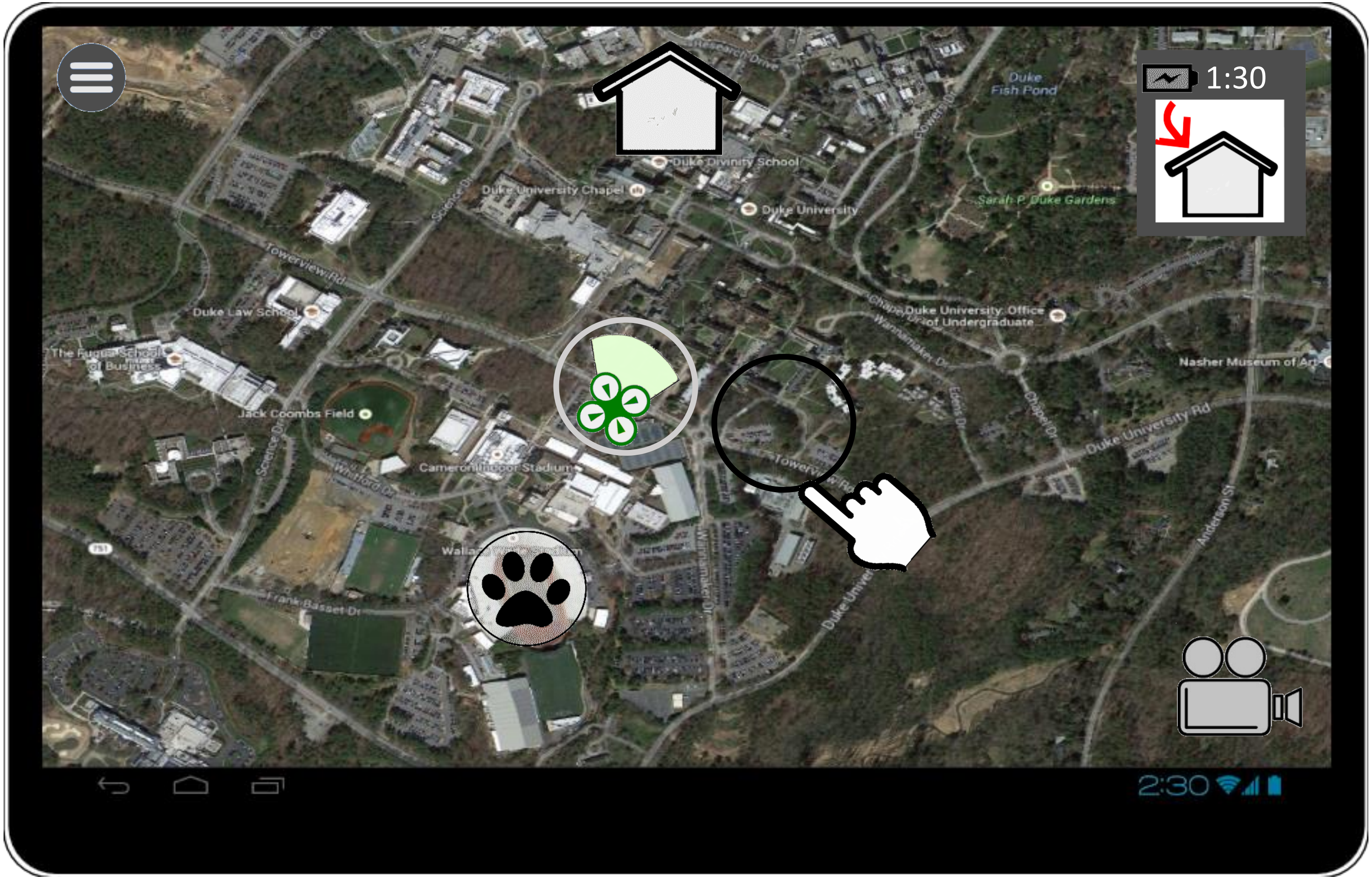

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The Fuqua School of Business
Chapel Dr
Duke University Office of Undergraduate
Wannamaker Dr
Nasher Museum of Art
Jack Coombs Field
Edens Dr
Chapel Dr
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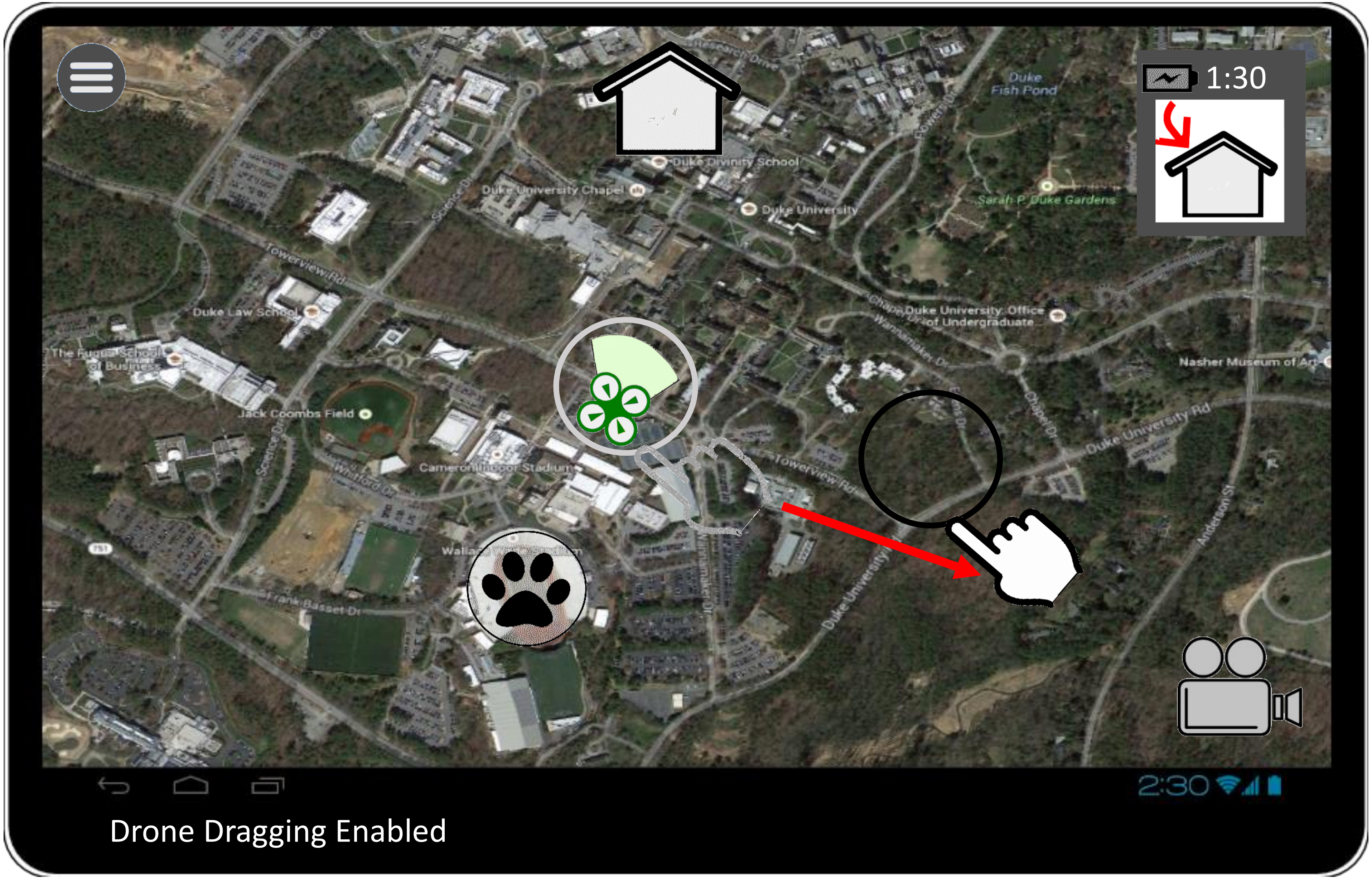
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Cameron Indoor Stadium
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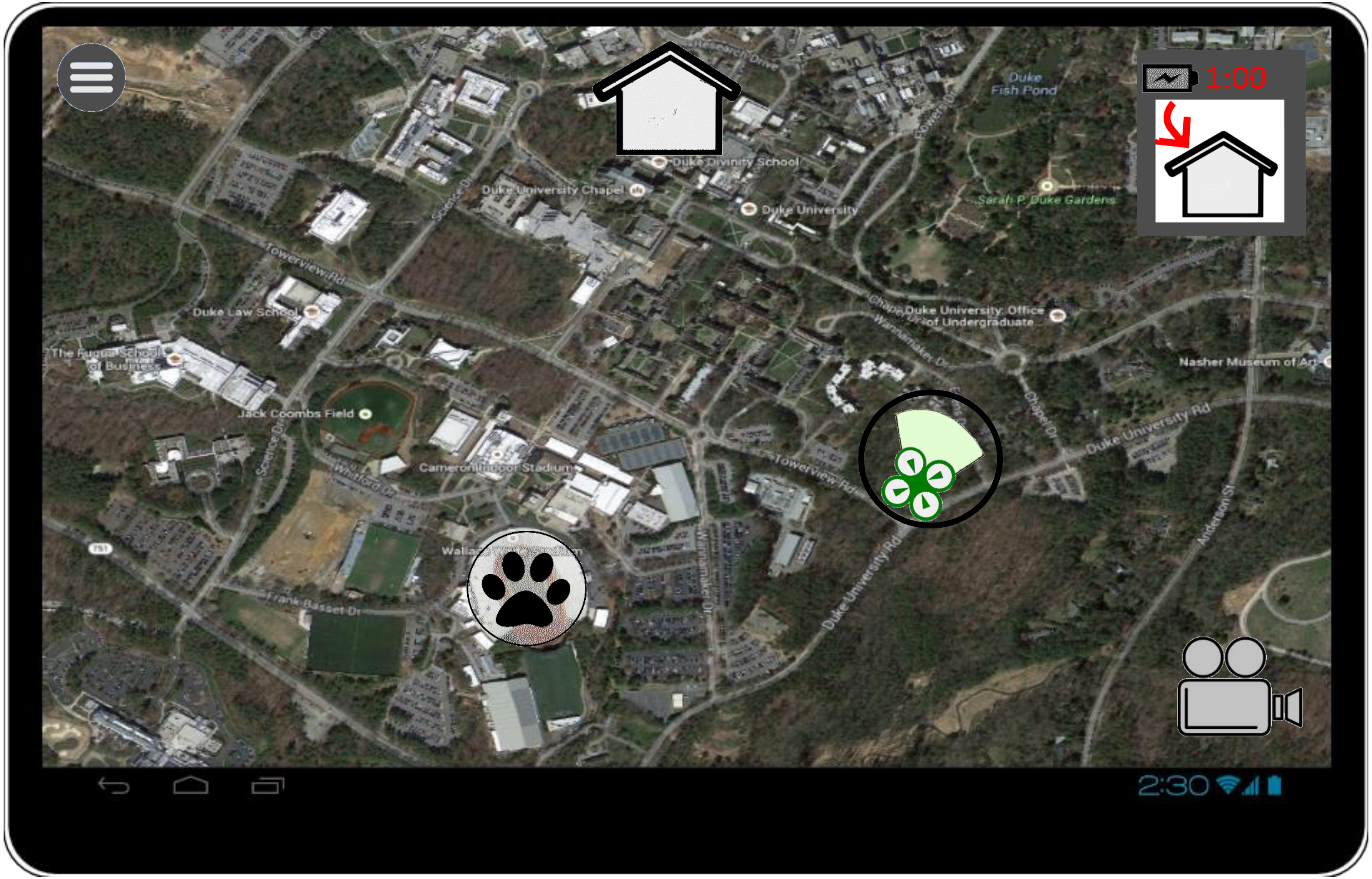
Nasher Museum of Art
Duke University Rd
Chapel Dr
Science Dr
Whitford Dr
Frank Basset Dr
Anderson St
2:30

Drone Dragging Enabled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Duke University Office of Undergraduate
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Wannamaker Dr
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Jack Coombs Field
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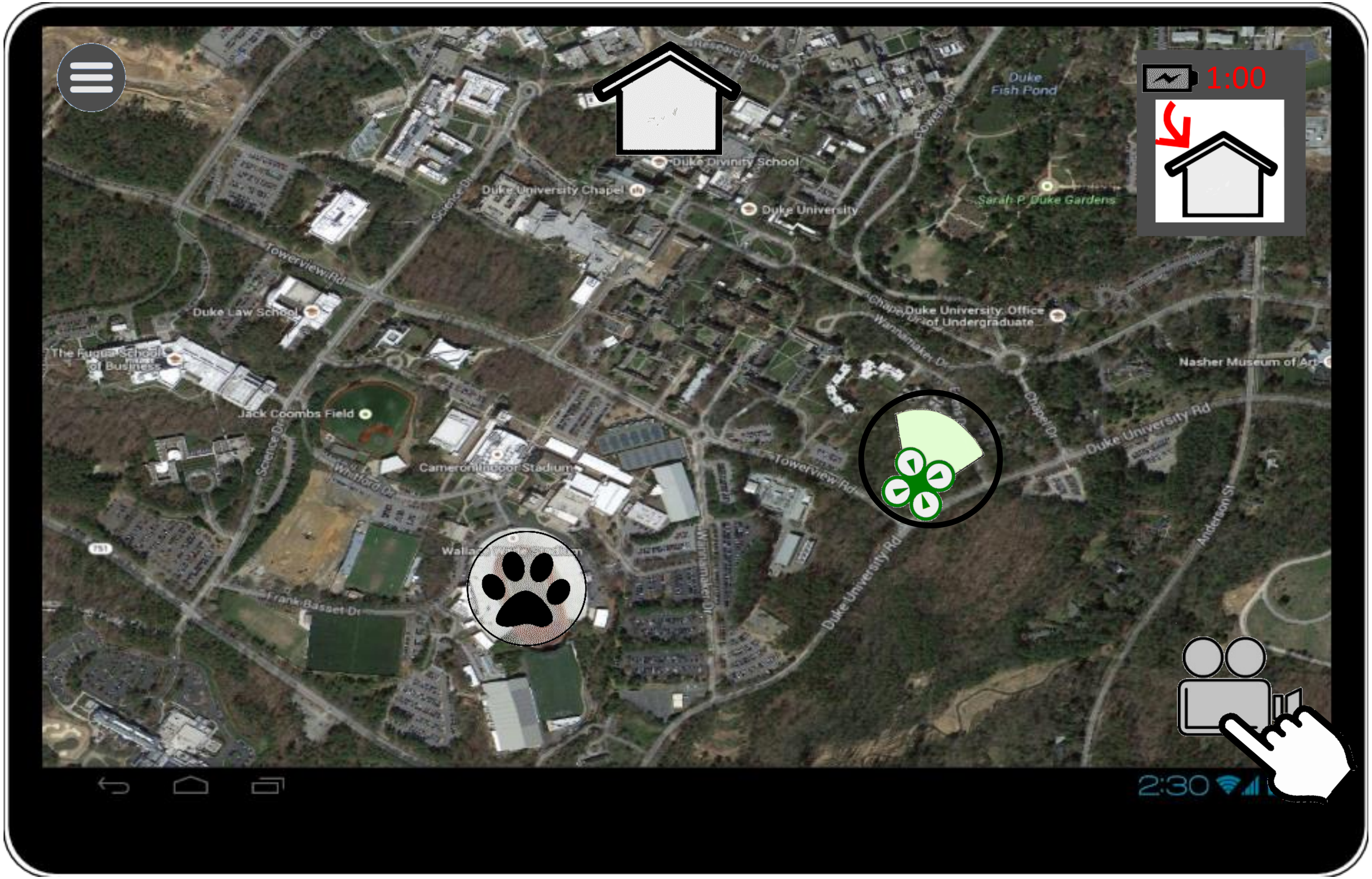
2:30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Sarah P. Duke Gardens
1:00
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Chapel Dr
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Nasher Museum of Art
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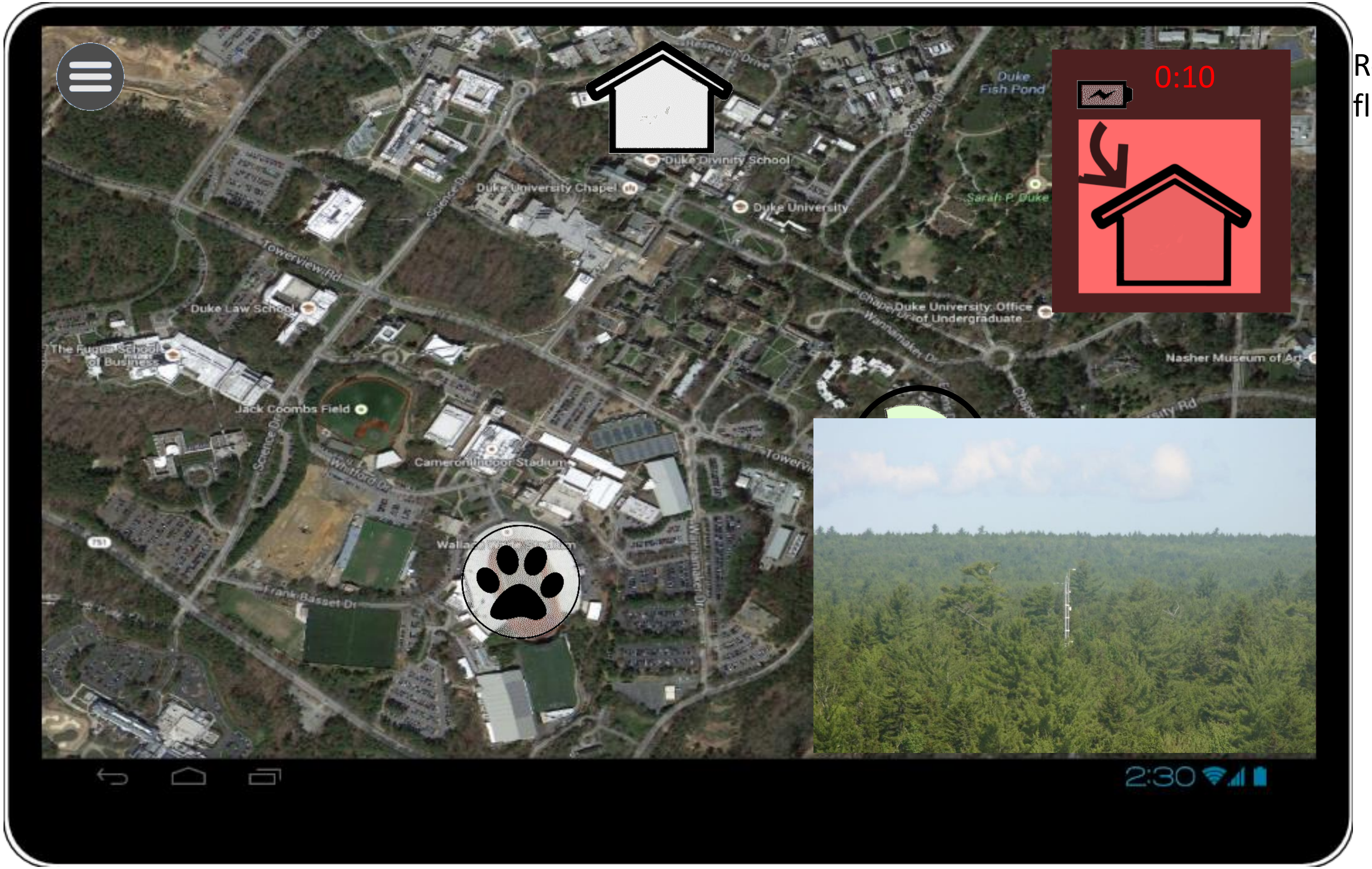
2:30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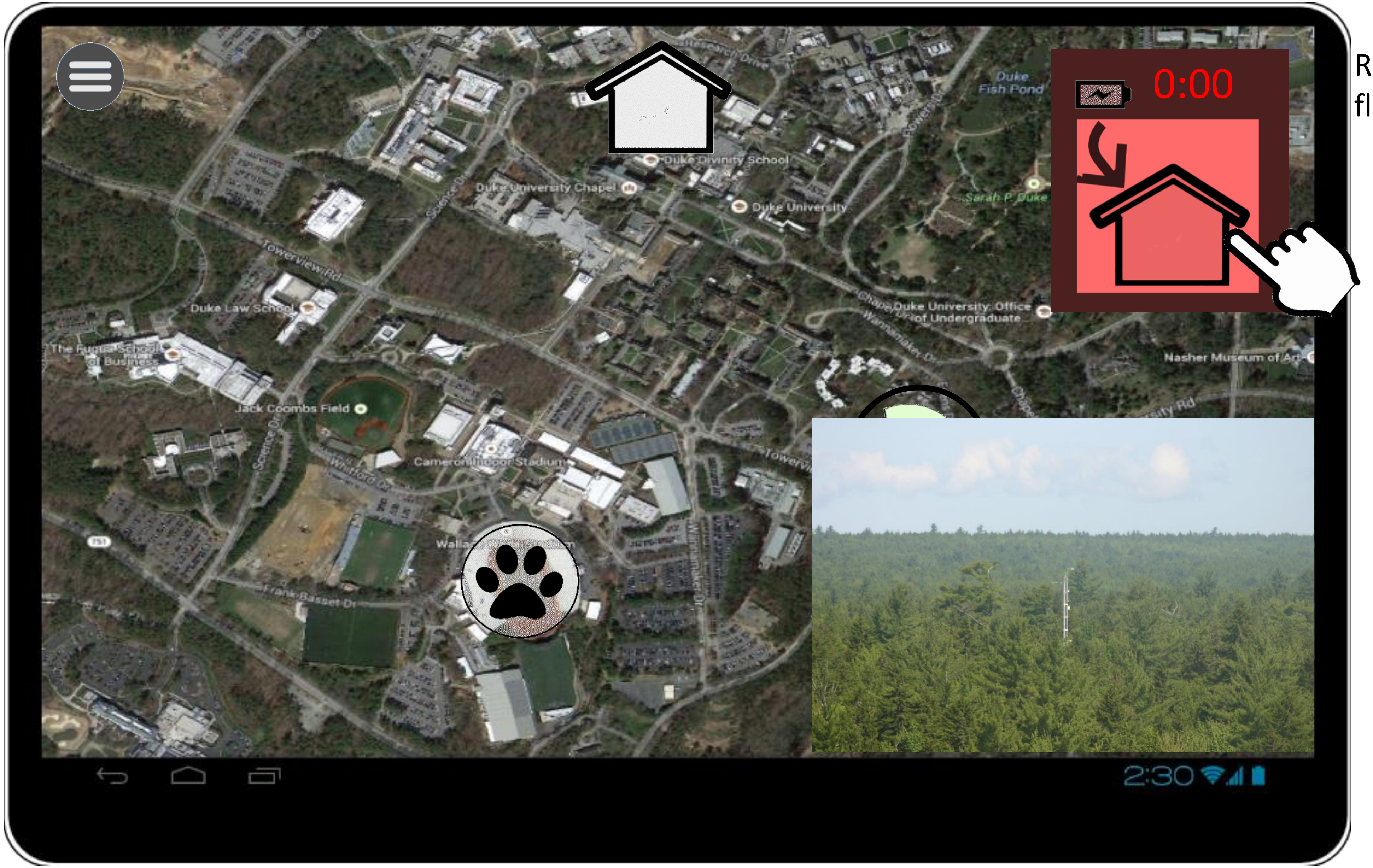
The Fuqua School of Business
Jack Coombs Field
Cameron Indoor Stadium
Frank Basset Dr
Duke University Office of Undergraduate
Nasher Museum of Art
Sarah P. Duke
2:30

Return button
flashes at critical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Nasher Museum of Art
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Research Drive
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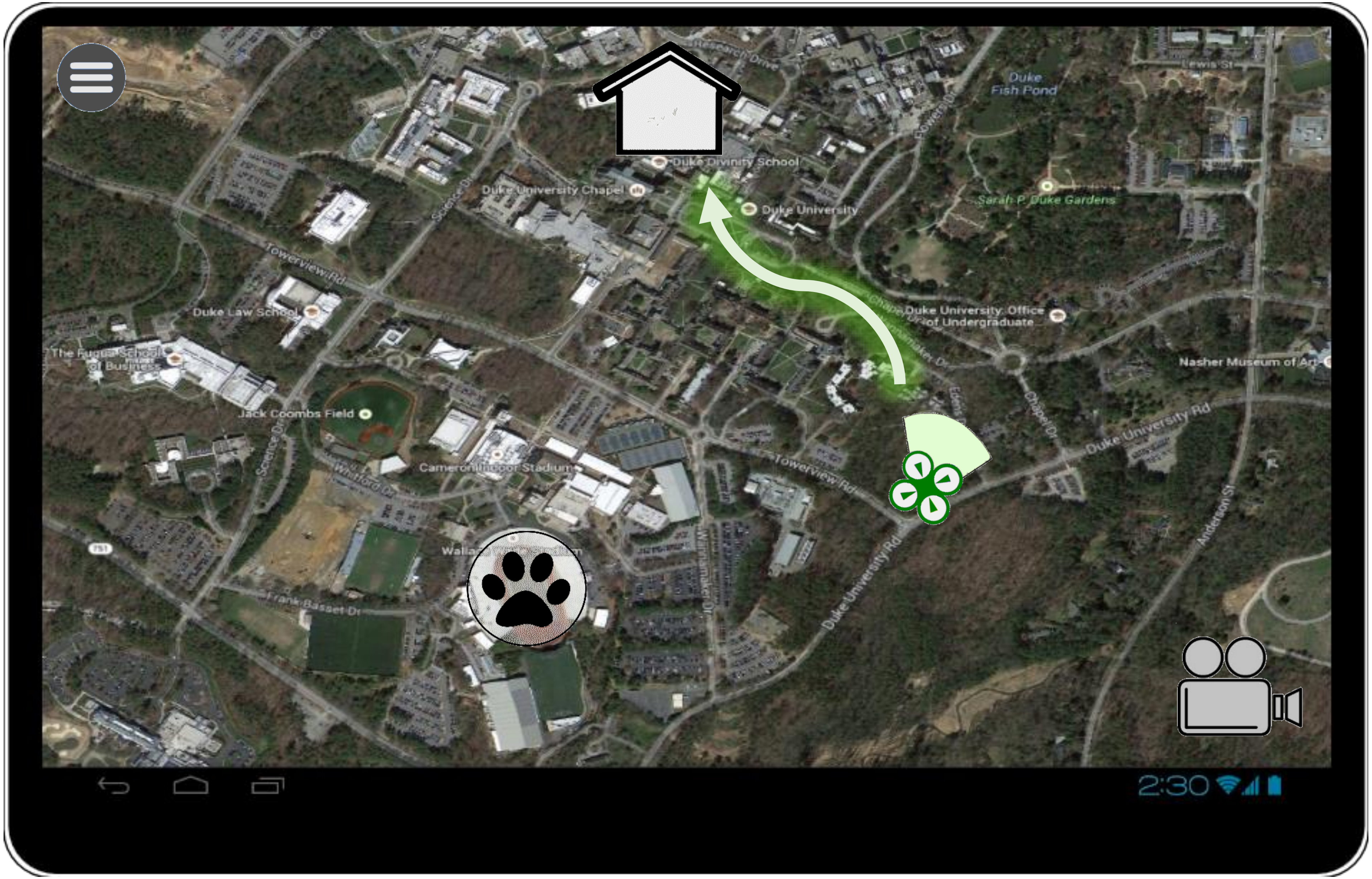
2:30

Return button
flashes at critical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Powers Dr
Duke Divinity School
Duke University Chapel
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Sarah P. Duke Gardens
Science Dr
Towerview Rd
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The Fuqua School of Business
Duke University Office of Undergraduate
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Jack Coombs Field
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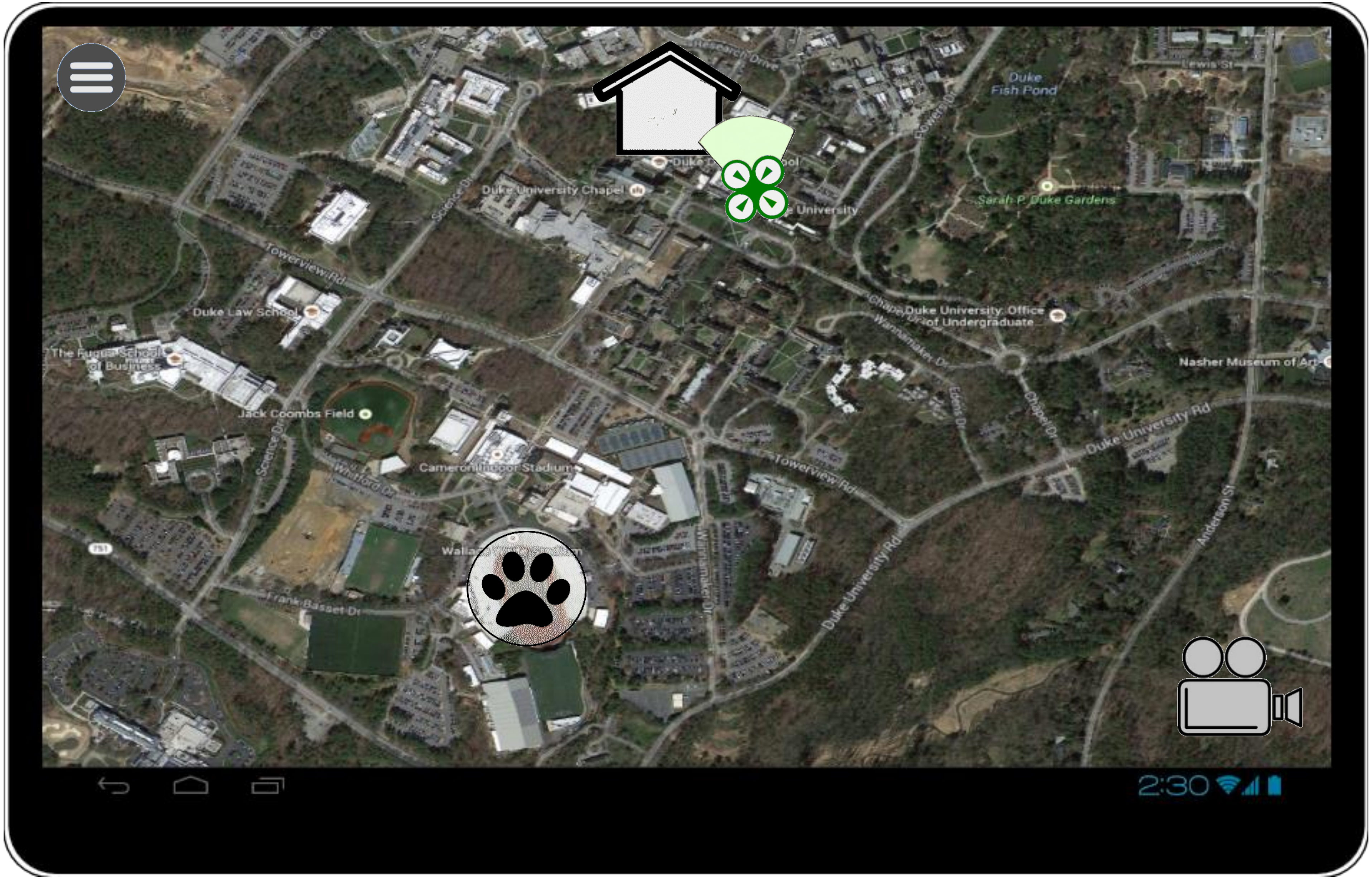
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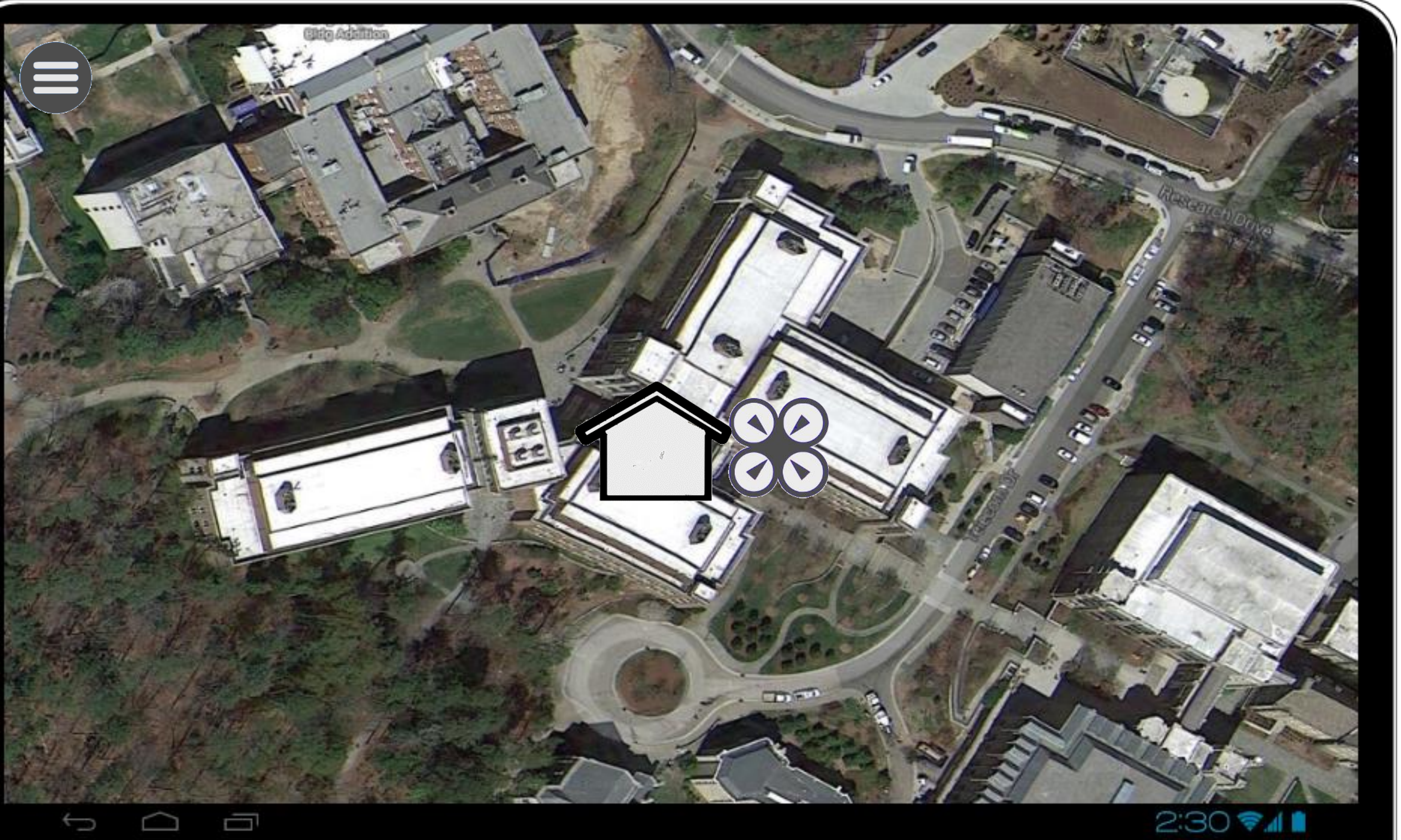
Bldg Addition
Research Drive
2:30

Drone automatically lands when it returns home