In favor of Trees
Improving Safety and Visibility for Sahra P. Duke Garden

Duke University
Founded in 1838, is a private research university located in Durham, NC. Duke Gardens receives approximately half of its operating budget from Duke University.

Sarah P. Duke
Dr. Hanes persuaded his friend Sarah P. Duke, widow of one of the university's founders, Benjamin N. Duke, to give $20,000 to finance a garden that would bear her name.

Ellen Biddle Shipman
Ellen Biddle Shipman (1859–1950), a pioneer in American landscape design, was selected to design the plans for both the construction and the plantings for the new gardens.

H.L. Blomquist Garden of Native Plants
The rolling-woodland terrain of the 6.5-acre H.L. Blomquist Garden of Native Plants is filled with more than 900 species and varieties of regional native plants.

Historic Gardens
The Historic Gardens are where Sarah P. Duke Gardens began in 1934, with an iris garden in what is now the South Lawn.

W.L. Culberson Asiatic Arboretum
Named for Duke Professor and former Duke Gardener Director William Louis Culberson, the Asiatic Arboretum is an 18-acre collection of plants representing the wealth of floral diversity in Southeast Asia.

Doris Duke Center & Gardens
Behind the Doris Duke Center are several distinct gardens. The Virtue Peace Pond and the Page-Robins White Garden adjoin the Angle Amphitheater, the setting for many special events.

UAV (Drones) Benefits
- UAV (Drones) Benefits
  - Unmanned aerial vehicles (UAVs)
  - Increasing use of drones by professionals and amateurs
  - Increasing UAV use in public space

UAV (Drones) Threats
- Perceived and real threats of UAVs to public safety/privacy
- Potential loss of existing values and use of public space

Research Questions
- What constitutes visual access to Sarah P. Duke Botanical Gardens?
- What degree of visibility creates significant conceptual "after-dances" for drone users in Sarah P. Duke Botanical Gardens?

Research Goals
- Develop a visual access method to predict vulnerable landscape areas.
- Develop landscape features to reduce visual accessibility.

In the Garden
- Public Art on the Lawn
- Path
- Pond in the Woods
- Road
- Service Center
- Path in the Woods
- Terrace
- Downtown Durham

Legend
- 147 Freeway
- Duke University
- Sahra P. Duke Gardens
- Site Entrances
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Terminal Project by Zheng Xie
Committee: Prof. Robert Hewitt (Chair)
Prof. Hala Hassar, Prof. Rye Jung Chang

The forest cover visual access matrix and the 3D visual access models suggest evaluative criteria that identify areas of the Sarah Duke Botanical Garden for landscape feature development to reduce aerial visibility.

Criteria:
The least visible areas provide the least affordances for drone use for aerial visibility.
The most visible areas provide the greatest affordances for such aerial visibility.
The most visible areas are the open spaces without tree cover and the edges of those open spaces with views to the interior of these spaces.
The next most visible areas are those with tree densities of 1-9 trees per grid section.
All other areas provide increasingly lower “affordances” for the drone user.
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Screen Wall
Portable Tree Bed

Space & Circulation Analysis

Plan

Model
Original
After

Section B-B'

Perspective Walls & Trees

Bird-eye View

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Plaza Area Reduced “Affordances” Perspective

Small Open Space Reduced “Affordances” Perspective