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Title: A system for 3D autonomous rotorcraft navigation in urban environments

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Abstract: Three-dimensional navigation will be an essential component of low-altitude unmanned rotorcraft operations in urban environments. Successful navigation will require that the vehicle sense the surrounding obstacles, incorporate the data into its world model, and react to new obstacles to ensure both vehicle survivability and satisfactory completion of the mission objectives. A complete navigation solution built on heuristic planning concepts is presented. A fast A*-based 3D route planner is compared with one that constructs 3D routes by executing a 2D planner on plane slices of the terrain. Monte Carlo simulation evaluation and flight test validation results are presented.

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