```
function [up_neighbor down_neighbor left_neighbor right_neighbor] = local_test(N, i,
j, Is_taken, S_mat, prob_mat, anchor, delta_s, delta_bg);

  up_neighbor = 0;
  down_neighbor = 0;
  right_neighbor = 0;
  left_neighbor = 0;

  if(i - 1 >= 1) %UP

    if(Is_taken(i - 1,j) == 0 && (anchor(1) - S_mat(i - 1,j))^2 < delta_s^2)

      up_neighbor = 1;

    endif

  endif

  if(i + 1 <= N) %DOWN

    if(Is_taken(i + 1,j) == 0 && (anchor(1) - S_mat(i + 1,j))^2 < delta_s^2)

      down_neighbor = 1;

    endif

  endif

  if(j - 1 >= 1) %LEFT

    if(Is_taken(i,j - 1) == 0 && (anchor(1) - S_mat(i,j - 1))^2 < delta_s^2)

      left_neighbor = 1;

    endif

  endif

  if(j + 1 <= N) %RIGHT

    if(Is_taken(i,j + 1) == 0 && (anchor(1) - S_mat(i,j + 1))^2 < delta_s^2)

      right_neighbor = 1;

    endif

  endif
```

```
                                        local_test
endfunction
```