Erratum to: Implementation of wide-field integration of optic flow for autonomous quadrotor navigation

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List of corrections

- Page 2, last paragraph of Sect. 1. Lines 7 through 13 should read: Section 4 discusses the identification of the vehicle dynamics and the implementation of the optic flow-based wide field integration control strategy. Section 5 describes in detail the closed loop stability of the vehicle during corridor navigation. Section 6 presents results and summarizes the effectiveness of wide field integration navigation using optic flow, as observed in the experimentation. Section 7 summarizes the conclusions.
- Page 2. The first paragraph of Sect. 3 should read: In this section a spatially continuous representation of planar optic flow for corridor environments is developed and a model for extracting relative position and orientation based on the L_2 inner product is introduced.

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- Page 5, last paragraph. Variable OF_{trans} should be omitted.
- Page 6. The first 3 lines of the first paragraph should read: Given a control gain K_v , reference height h_0 and a commanded input ϕ_r , the resulting transfer function for the lateral degree of freedom is
- Page 6. Equation (8) should read:

$$\frac{v}{\phi_r} = \frac{g}{s + (Y_v + \frac{K_v}{h_0})}.$$

- Page 6. Equation (9) should read:

$$\dot{r} = -(N_r + K_r)r + N_{\mu_{yaw}}\mu_{yaw}.$$

- Page 6. The last sentence of the first paragraph should read: The term $(N_r + K_r)$ sets the closed loops bandwidth attained by the vehicle avionics.
- Page 7. Equation (11) should read:

$$\ddot{x} = -\left(X_u + \frac{K_u}{h_0}\right)\dot{x} + g\theta_r,$$

$$\ddot{y} = -\left(Y_v + \frac{K_v}{h_0}\right)\dot{y} + g\phi_r,$$

$$\ddot{\psi} = -(N_r + K_r)\dot{\psi} + N_{\mu_{yaw}}r_r.$$

- Page 7. The last paragraph should read: To close the outer feedback loop that governs heading and lateral control, reference inputs ϕ_r and r_r in (11) are set equal to (12), scaled by gains K_y and K_ψ .
- Page 7. Equation (14) should read:

$$\phi_r = K_y \langle \dot{Q}, F_y \rangle,$$

$$r_r = K_\psi \langle \dot{Q}, F_\psi \rangle.$$

- Page 8. Equation (15) should read:

$$\begin{Bmatrix} \dot{y} \\ \ddot{y} \\ \dot{\psi} \\ \ddot{\psi} \end{Bmatrix} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ -K_y \frac{u_0 g}{2a^2} & -(Y_v + \frac{K_v}{h_0}) & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & K_\psi \frac{N_{\mu yaw}}{2a} & -K_\psi \frac{u_0 N_{\mu yaw}}{a} & -(N_r + K_r) \end{bmatrix} \begin{Bmatrix} y \\ \dot{y} \\ \psi \\ \dot{\psi} \end{Bmatrix}.$$

- Page 8, first paragraph. The second sentence should read: The feedback gains K_y and $K_\psi, \dots$; and the third sentence should read: ... such that the K_y gain was equal to that of the K_ψ gain.
- Page 8. Right after the third sentence in Sect. 6 the following text should be inserted: The procedure for each flight test was to lift off and position the vehicle at its initial

flight condition at the beginning of the corridor, engage the sonar-based altitude control, input a step in reference pitch angle θ_r to the vehicle to begin moving down the corridor, and engage optic flow for lateral and orientation control.