flexible appendages, frames with pretensioned membranes, and flexible toroidal structures. Since the majority of these subjects are covered in great detail in many texts, I believe this chapter could have been reduced to a couple of pertinent subsections within Chapter 9 by limiting the discussion to flexible appendages and frames. Chapter 9 provides a discussion of combined attitude and structural control concepts for many interesting and pertinent problems, including thrust vector control with propellant slosh, attitude control of a bias-momentum spacecraft with flexible solar arrays, attitude and station-keeping control of a three-axis stabilized spacecraft with flexible solar arrays, nonlinear pulse-modulated control of a flexible spacecraft, and control redesign of the Hubble Space Telescope to reduce pointing jitter induced by the flexible solar arrays. Additionally, a discussion and summary of recent research activities in active structural vibration control is provided in the final section. Although not typically considered under the auspices of spacecraft control, these concepts are applicable to large spacecraft with tight payload pointing requirements. The final chapter provides a detailed discussion of robust optimal maneuvers of flexible spacecraft. Included are time- and fuel-optimal maneuver strategies, control with one-sided inputs, and preshaped feedforward command generation. Though primarily intended for jet thruster control systems, some of these concepts can be applied to reaction wheel control as well. As in Part 3, the wide range of topics covered within the chapters of Part 4 demonstrate the diverse knowledge and experience Professor Wie brings to the field of spacecraft control.

In summary, I highly recommend this text for advanced undergraduate- and graduate-level studies as well as for practicing spacecraft control engineers, especially in the area of spacecraft attitude control. The book includes a compendium of both recent research and established practice, and the wide selection of references provided at the end of each chapter and in the Bibliography present the interested reader with multiple sources for further research and understanding of the subject.

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# Errata

## Autonomous Maneuver Tracking for Self-Piloted Vehicles

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EQUATION (10) should be corrected as follows:
Equation (10) should read

$$\begin{bmatrix} \frac{1}{QSb}(-I_{xz}(pq) - (I_{yy} - I_{zz})qr) \\ \frac{1}{QS\bar{c}}\left(-I_{xz}(r^2 - p^2) - (I_{zz} - I_{xx})rp\right) \\ \frac{1}{QSb}(-I_{xz}(-qr) - (I_{xx} - I_{yy})pq) \end{bmatrix} - \begin{bmatrix} C_{l_0} \\ C_{M_0} \\ C_{N_0} \end{bmatrix} - \begin{bmatrix} C_{l_\alpha} & C_{l_\beta} & C_{l_{\delta_t}} & C_{l_p} & C_{l_q} & C_{l_r} \\ C_{M_\alpha} & C_{M_\beta} & C_{M_{\delta_t}} & C_{M_p} & C_{M_q} & C_{M_r} \\ C_{N_\alpha} & C_{N_\beta} & C_{N_{\delta_t}} & C_{N_p} & C_{N_q} & C_{N_r} \end{bmatrix} \cdot \begin{bmatrix} \alpha \\ \beta \\ \delta_t \\ \hat{p} \\ \hat{q} \\ \hat{r} \end{bmatrix}$$

$$= \begin{bmatrix} C_{l_{\delta_e}} & C_{l_{\delta_a}} & C_{l_{\delta_r}} \\ C_{M_{\delta_e}} & C_{M_{\delta_a}} & C_{M_{\delta_r}} \\ C_{N_{\delta_e}} & C_{N_{\delta_a}} & C_{N_{\delta_r}} \end{bmatrix} \cdot \begin{bmatrix} \delta_e \\ \delta_a \\ \delta_r \end{bmatrix}$$