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Abstract
The design and analysis of AC permanent-magnet servo motor drive system is presented in detail in the thesis. The design of an encoder, voltage space vector pulse-width modulation, and trajectory planning are considered in the system. The XY table that its X-axis motion is driven by a permanent-magnet linear synchronous motor and Y-axis motion driven by a permanent-magnet synchronous motor is employed to demonstrate the design and to be applied to a virtual fishing system.

The virtual fishing system includes a PC that combines the 3D Studio Max and EON Studio software packages to construct 3D scenes, a fishing boat that is simulated by a three-axis manipulator which consists of three pneumatic cylinders serving as extensive linkage, and the XY table that is equipped with an interactive fishing rod with line rolling mechanism and force feedback hardware. DSP TMS320LF2812 that consists of ADC, QEP, and SVPWM modules is used to implement the hardware and software. A foregoing design on encoders by sputtering thin film onto the disk is studied.

Finally, the step response and sine wave response of single axis, and the trajectory tracking of two-axis system are demonstrated to present the design.
Advisory Committee Wang, Ming-Shyan - advisor

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