XFOIL Airfoil Design/Analysis Software — Summary
16 May 94

XFOIL is an interactive program for the design and analysis of subsonic isolated airfoils. It consists of a collection of menu-driven routines which perform functions such as:

- Viscous (or inviscid) analysis of an existing airfoil
- Multi-point airfoil design by interactive specification of surface speed via mouse cursor.
- Direct geometric manipulation (flap, camber, contour deformation, etc.)
- Drag polar calculation with fixed or varying Mach,Reynolds numbers.
- Writing and reading of airfoil geometry and polar save files.
- Plotting of geometry, pressure distributions, and polars.

The inviscid formulation of **XFOIL** is a linear-vorticity stream function panel method. The Karman-Tsien compressibility correction gives good flow predictions up to sonic conditions. Two different inverse methods are incorporated, giving maximum flexibility in airfoil design and redesign problems. Surface speed distributions are input using a mouse cursor, and the resulting airfoil geometry is calculated in seconds and displayed. Analysis can be immediately performed on the new airfoil.

XFOIL incorporates a reliable viscous integral formulation into the basic inviscid panel method, allowing accurate drag and stall predictions in the Reynolds number range of 10^5 to 10^8. Blunt trailing edges are permitted. Transition locations can be specified or determined from a built-in transition criterion. Transitional separation bubbles and trailing edge separations are predicted.

Most of the **XFOIL** functions execute nearly instantly on a 30-MIPS workstation. The inviscid analysis routine requires a few seconds, while a single point viscous analysis requires less than 15 seconds. An entire viscous polar sweep requires several minutes of CPU time. **XFOIL** currently runs on DEC, IRIS, HP-9000, and RS/6000 platforms and uses X-Windows screen graphics and PostScript hardcopy.

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XFOIL is freely available for academic teaching and research use. Contact:

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