962-34-684 **Ahmed I Zayed*** (zayed@pegasus.cc.ucf.edu), Department of Mathematics, University of Central Florida, Orlando, FL 32816. *Inverse Problems in Sampling Theory.* Preliminary report.

Consider the Sturm-Liouville boundary-value problem:

$$\begin{aligned} -y'' + q(x)y &= \lambda y, \quad -\infty < a \le x \le b < \infty, \\ y(a)\cos\alpha + y'(a)\sin\alpha &= 0 \\ y(b)\cos\beta + y'(b)\sin\beta &= 0, \end{aligned}$$

where $q \in C[a,b]$. It is known that this problem has an infinitely countable set of eigenvalues and that the corresponding eigenfunctions form a complete orthogonal system in $L^2[a,b]$. Loosely speaking, the inverse problem is to reconstruct the potential function $q(x)$ assuming that the eigenvalues are known. The connection between inverse problems and boundary-value problems has been known for awhile. But only in the last ten years has the connection between boundary-value problems and sampling theorems, in particular the Whittaker-Shannon-Kotel'nikov, and Kramer sampling theorems, been investigated. In this talk we discuss the relationship between inverse problems and sampling theorems, in particular, between inverse problems and the Lagrange interpolation procedure. (Received September 20, 2000)