# بسم الله الرحمن الرحيم

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تم عمل المسح الضوئي لهذة الرسالة بواسطة / حسام الدين محمد مغربي

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات:

- بالرسالة صفحات لم ترد بالأصل
- بعض الصفحات الأصلية تالفة
- بالرسالة صفحات قد تكون مكررة
- بالرسالة صفحات قد يكون بها خطأ ترقيم

# A NEW ALGORITHM FOR SOME LINEAR COMPLEMENTARITY PROBLEMS WITH APPLICATIONS

By

**IMAN MOHAMED SHABAN SHARAF**



A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
**Doctor of Philosophy**
in
**Engineering Mathematics**

**Faculty of Engineering, Cairo University**
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# List of Abbreviations

| | |
|---|---|
| **AVI** | Affine variational inequality |
| **BLCP** | The bounded linear complementarity problem |
| **BLNP** | Bilinear programming |
| **BLVP** | Bilevel linear program |
| **CQP** | Convex quadratic programming |
| **GLCP** | The generalized linear complementarity problem |
| **HLCP** | The horizontal linear complementarity problem |
| **IPMs** | Interior point methods |
| **LCP** | Linear complementarity problem |
| **LP** | Linear programming |
| **LPP** | Linear programming problem |
| **MLCP** | The mixed linear complementarity problem |
| **MPEC** | Mathematical programming with equilibrium constraints |
| **NCP** | Nonlinear complementarity problem |
| **NE** | Nonlinear equations |
| **PD** | Positive definite |
| **PSD** | Positive semidefinite |
| **QP** | Quadratic programming |
| **QPP** | Quadratic programming problem |
| **SLCP** | Sequential Linear complementarity problem |
| **SOR** | Successive overrelaxation |
| **SQP** | Sequential quadratic programming |
| **UIP** | Unified interior point method |
| **VCP** | The vertical complementarity problem |
| **VI** | Variational inequality |
| **VLCP** | The vertical linear complementarity problem |
| **XLCP** | The extended linear complementarity problem |