# 서상협 (Seo, Sang-hyup)

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## 연구분야

수치선형대수학; 비선형행렬방정식

## 교육

**이학박사, 부산대학교** **2012.03 – 2019.02**

◦ 졸업논문 : Accelerations of Newton's Methods Solving Nonlinear Matrix Equations

**이학석사, 부산대학교** **2010.03 – 2012.02**

◦ 졸업논문 : The Numerical Method for Solving a Quadratic Matrix Equation with Special Coefficient Matrices

## 경력사항

**국가수리과학연구소** **2019.10 –**

◦ 박사후연구원

**부산대학교** **2019.03 – 2019.09**

◦ 박사후연구원

**(주)스마트소셜** **2017.03 – 2017.10**

◦ 사원 : 데이터베이스 분석, 상품 및 과제 기획

## 연구실적

### 논문

2013 Seo, Sang-Hyup, Seo, Jong-Hyun, and Kim, Hyun-Min, "Newton's Method for Solving a Quadratic Matrix Equation with Special Coefficient Matrices", *Honam Math. J.*, 35(3), 417–433, Sep. 2013.

2018 Meng, J., Seo, S. & Kim, H. "Condition Numbers and Backward Error of a Matrix Polynomial Equation Arising in Stochastic Models", *J. Sci. Comput.* 76, 759–776 (2018).

2018 Seo, Sang-Hyup, Seo, Jong-Hyeon, and Kim, Hyun-Min, "A Modified Newton Method for a Matrix Polynomial Equation Arising in Stochastic Problem", *Electron. J. Linear Algebra*, 34, 500–513, 2018.

2019 Kim, Taehyeong, Sang-Hyup Seo, and Hyun-Min Kim. "On Newton's Method for Solving a System of Nonlinear Matrix Equations." *East Asian Math. J.* 35(3), 341–349, 2019.

2020 Seo, Sang-hyup, and Jong-Hyeon Seo. "Convergence of relaxed Newton method for order-convex matrix equations", *Comput. Appl. Math.* 39(1), 1–17, 2020.

### 과제참여

안과질환 진단서비스 플랫폼 개발사업 : 참여연구원 2019.05 – 현재
◦ 지원기관 : 부산광역시

### 발표실적

- "Convergence of a Modified Newton Method for a Matrix Polynomial Equation Arising in Stochastic Problems", *Numerical Analysis and Scientific Computation with Applications 2018*, Elite City Resort in Kalamata, Greece, Jul. 2–6, 2018.
- "Convergence of Newton Iterations for Order-Convex Matrix Functions", *SIAM Conference on Applied Linear Algebra*, Hyatt Regency Atlanta, USA, Oct. 26-30, 2015.
- "The Existence and Convergence of Two Iterations for Differentiable Order-Convex Matrix Functions", *The 2014 International Conference on Tensors and Matrices and their Applications*, Suzhou, China, Dec. 16–19, 2014.
- "The Newton and the Fixed Point Iterations for Differentiable Order-Convex Matrix Functions", *International Linear Algebra Society Conference 2014*, Sungkyunkwan

University, Korea, Aug. 6–9, 2014.

- "The Monotone Convergence of Newton's Method for Differentiable Convex Matrix Functions", *Hakata Workshop 2014*, Kyushu, Japan, Feb. 8, 2014.
- "The Elementwise Convex Condition for Differentiable Matrix Functions", *AKOOS-PNU*, Pusan National University, Korea, Feb. 5–7, 2014.
- "Newton's method for solving a quadratic matrix equation with special coefficient matrices", *KOOK-TAPU Joint Seminar 2013*, Osaka City University, Japan, Jul. 22–26, 2013.

### 포스터 발표

- "Properties of Nonnegative, Irreducible, and $M$-Matrices", *The Asian Mathematical Conference 2013*, BEXCO, Korea, Jun. 30–Jul. 4, 2013.

# Seo, Sang-hyup (서상협)

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## Research Interests

Numerical Linear Algebra; Nonlinear Matrix Equations

## Education

**Ph. D., Pusan National University** **2012.03 – 2019.02**

∘ Thesis : Accelerations of Newton's Methods Solving Nonlinear Matrix Equations

**MS., Pusan National University** **2010.03 – 2012.02**

∘ Thesis : The Numerical Method for Solving a Quadratic Matrix Equation with Special Coefficient Matrices

## Career

**National Institute for Mathematical Sciences** **2019.10 –**

∘ Post Doctor

**Pusan National University** **2019.03 – 2019.09**

∘ Post Doctor

**Smart Social, Inc.** **2017.03 – 2017.10**

∘ Staff : Analysis for Database, Product and Project Planning

# Publications

## Papers

2013 Seo, Sang-Hyup, Seo, Jong-Hyun, and Kim, Hyun-Min, "Newton's Method for Solving a Quadratic Matrix Equation with Special Coefficient Matrices", *Honam Math. J.*, 35(3), 417–433, Sep. 2013.

2018 Meng, J., Seo, S. & Kim, H. "Condition Numbers and Backward Error of a Matrix Polynomial Equation Arising in Stochastic Models", *J. Sci. Comput.* 76, 759–776 (2018).

2018 Seo, Sang-Hyup, Seo, Jong-Hyeon, and Kim, Hyun-Min, "A Modified Newton Method for a Matrix Polynomial Equation Arising in Stochastic Problem", *Electron. J. Linear Algebra*, 34, 500–513, 2018.

2019 Kim, Taehyeong, Sang-Hyup Seo, and Hyun-Min Kim. "On Newton's Method for Solving a System of Nonlinear Matrix Equations." *East Asian Math. J.* 35(3), 341–349, 2019.

2020 Seo, Sang-hyup, and Jong-Hyeon Seo. "Convergence of relaxed Newton method for order-convex matrix equations", *Comput. Appl. Math.* 39(1), 1–17, 2020.

## Projects

Development of a Service Platform for Ophthalmology Disease Diagnosis
: Co-investigator 2019.05 – Present
◦ Support : Busan Metropolitan City

## Presentations

- "Convergence of a Modified Newton Method for a Matrix Polynomial Equation Arising in Stochastic Problems", *Numerical Analysis and Scientific Computation with Applications 2018*, Elite City Resort in Kalamata, Greece, Jul. 2–6, 2018.
- "Convergence of Newton Iterations for Order-Convex Matrix Functions", *SIAM Conference on Applied Linear Algebra*, Hyatt Regency Atlanta, USA, Oct. 26-30, 2015.
- "The Existence and Convergence of Two Iterations for Differentiable Order-Convex Matrix Functions", *The 2014 International Conference on Tensors and Matrices and their Applications*, Suzhou, China, Dec. 16–19, 2014.

- "The Newton and the Fixed Point Iterations for Differentiable Order-Convex Matrix Functions", *International Linear Algebra Society Conference 2014*, Sungkyunkwan University, Korea, Aug. 6–9, 2014.
- "The Monotone Convergence of Newton's Method for Differentiable Convex Matrix Functions", *Hakata Workshop 2014*, Kyushu, Japan, Feb. 8, 2014.
- "The Elementwise Convex Condition for Differentiable Matrix Functions", *AKOOS-PNU*, Pusan National University, Korea, Feb. 5–7, 2014.
- "Newton's method for solving a quadratic matrix equation with special coefficient matrices", *KOOK-TAPU Joint Seminar 2013*, Osaka City University, Japan, Jul. 22–26, 2013.

**Poster Presentations**

- "Properties of Nonnegative, Irreducible, and $M$-Matrices", *The Asian Mathematical Conference 2013*, BEXCO, Korea, Jun. 30–Jul. 4, 2013.