**Name: Yafit Natani** **Date:** 08/06/2025

Faculty of Computer Science

The College of Management Academic Studies

# CURRICULUM VITAE

## 1. Personal Details

Electronic Address: yafitnat@colman.ac.il

Marital Status: married

## 2. Higher Education

| | | |
|---|---|---|
| B.Sc. | 2005 | Department of Mathematics & Computer Science, Bar-Ilan University. |
| Teacher's Certificate | 2006 | School of Education, Bar-Ilan University. |
| Teaching License | 2008 | Ministry of Education (Israel). |
| M.Sc. | 2009 | Department of Mathematics, Bar-Ilan University.<br>Topic: The Quiver of The Semigroup Algebra of Bands.<br>Supervisor: Prof. Stuart W. Margolis.<br>Honors: magna cum laude. |
| Ph.D. | 2016 | Department of Mathematics, Bar-Ilan University.<br>Topic: The Quiver of The Semigroup Algebra of Bands.<br>Supervisors: Prof. Stuart W. Margolis. and Prof. Malka Schaps. |

## 3. Academic Ranks and Tenure in Institutes of Higher Education

| Dates | Institution and Department | Rank/Position |
|---|---|---|
| 2006-2014 | Department of Mathematics & Computer Science, Faculty of Engineering, Bar-Ilan University. | teaching assistant |

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|---|---|---|
| 2015-2016 | Department of Mathematics & Computer Science, Faculty of Engineering, Bar-Ilan University. | Lecturer |
| 2013-2015 | School of Computer Science, The College of Management Academic Studies. | teaching assistant |
| 2016-2025 | School of Computer Science, The College of Management Academic Studies. | Lecturer |
| 2016-2025 | Faculty of Science and Engineering, Holon Institute of Technology. | Lecturer |

## 4. Invited Lectures\ Colloquium Talks

| Date | Place of Lecture | Name of Forum | Presentation/Comments |
|---|---|---|---|
| 4/2016 | Bar-Ilan University | Colloquium in Mathematics | The Semigroup Algebra of Bands |
| 4/2017 | Bar-Ilan University | Colloquium in Mathematics | The Quiver of The Semigroup Algebra of Bands |
| 5/2018 | Bar-Ilan University | Colloquium in Representation Theory | The Semigroup Algebra of Bands |

## 5. Research Grants

### Submission of Research Proposals

| Role in Research | Co-Researchers | Topic | Funded by | Year |
|---|---|---|---|---|
| CO-PI | Prof. Malka Schaps | The Representations of Nested Composition Algebras.<br>Appeared in: Communications in Algebra | Milgat Nasi, Bar-Ilan university | 2017 |

## 6. Scholarships, Awards and Prizes

**2025** **Excellence in teaching**, The College of Management Academic Studies, Israel.

**2025** **Excellence in teaching**, Holon Institute of Technology, Israel.

**2024** **Excellence in teaching**, Holon Institute of Technology, Israel.

**2019** **Excellence in teaching**, The College of Management Academic Studies, Israel.

**2010-2014** **Milgat Nasi**, Bar-Ilan University (NIS 160,000).

**2009** **Excellence Award in the name of David Berkovsky**, Bar Ilan University (NIS 2,000).

**2008-2009** **Department of Mathematics Scholarship**, Bar Ilan University (NIS 12,000).

**2005-2007** **Department Scholarship for Outstanding Students**, Bar Ilan University (NIS 4,000).

## 7. Teaching

### Courses Taught in Recent Years

| Year | Course Name | Type: Lecture/Seminar/Workshop/ High Learn Course/Introduction | Degree |
|---|---|---|---|
| 2006-2010 | Introduction to Calculus | High Learn Course | BSc |
| 2016-2025 | Calculus | High Learn Course | BSc |
| 2007-2025 | Linear Algebra | High Learn Course | BSc |
| 2007-2025 | Discreet Math | High Learn Course | BSc |
| 2013-2025 | Logics in C.S | High Learn Course | BSc |
| 2017-2018 | Statistics | High Learn Course | BSc |
| 2016 | Commutative Algebra | High Learn Course | BSc |
| 2016 | Non Commutative Algebra | High Learn Course | BSc |
| 2013-2015 | Number Theory | High Learn Course | BSc |
| 2013-2015 | Automata and Formal Languages | High Learn Course | BSc |
| 2013-2015 | Graph Theory | High Learn Course | BSc |
| 2015 | Advanced Algebra | Lecture | MSc |
| 2006-2007 | Group Theory | Lecture | BSc |
| 2007-2010 | Abstract Algebra | Lecture | BSc |

## 8. Professional Experience

2004-2005 Computer Science and Math Teacher in "Emuna" High-School, Bnei-Brak.

# PUBLICATIONS

## A. Ph.D. Dissertation

Title: The Quiver of The Semigroup Algebra of Bands
Date of submission: September,2015
Number of Pages: 110
Language: English
University: Bar-Ilan
Supervisors: Prof. Stuart W. Margolis. and Prof. Malka Schaps

## B. Articles in Refereed Journals

### Accepted for Publication

Name of article: The Representations of Nested Composition Algebras (22 pages).
Accepted for publications in: **Communications in Algebra**, August 2017.

## C. Summary of My Research Activities and Future Plans

Our goal is to investigate the quiver and the basis graph of the monoid algebra of a submonoid of the monoid of mappings from N to itself, defined by a nested sequence of compositions of N. Each such monoid is a left regular band, that is, a semigroup S satisfying x2 = x and xyx = xy for all x, y in S. This class is sufficiently rich that every path algebra of an acyclic quiver can be embedded in such a monoid algebra.
Our case of nested composition monoids algebra is one of several, when each element m of the monoid corresponds to the label m' of a vertex or arrow in the basis graph, so the algebra structure is closely connected to the monoid structure.
For our monoid M we found a representation of monoid elements and a corresponding representation of a basis of the algebra. We determined the dimension of the monoid algebra kM, and we discovered that the algebra multiplication has a particularly simple quasi multiplicative form, we used this form to find labels for the quiver arrows and relations defined over the integers.
We then study the Ext functors for this monoid algebra, using the order complex.
We also gave a complete classification of these nested composition monoids algebra which are hereditary, i.e. each submodule of a projective module is projective. The proof involved a combination of the Ext functors with calculations of the dimension of kM and the path algebra kQ.
In the future we plan to continue to study other semigroups and monoids, and also their semigroup and monoid algebra. We want to find their quiver and basis graph and then find out when they are hereditary.