



## 联系方式



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## 答辩委员会成员:

Dr. Eli Tilevich, Professor, Virginia Tech

Dr. Shigeru Chiba, Professor, The University of Tokyo

Dr. Na Meng, Assistant Professor, Virginia Tech

Dr. Francisco Servant, Assistant Professor, Virginia Tech

Dr. Muhammad Ali Gulzar, Assistant Professor, Virginia Tech

# 刘寅

## Ph.D.

北京工业大学软件学院讲师。

博士毕业于美国弗吉尼亚理工大学 (Virginia Tech) 计算机学院 (全美计算机专业排名40,

THE全球大学排名201-250) 研究涵盖 程序设计语言、软件工程、系统安全的交叉方向。

攻读博士之前, 在Sony移动公司作为软件开发工程师工作3.5年。

## 教育背景

2016–2021 弗吉尼亚理工大学 (Virginia Tech), 美国

博士, 计算机科学与应用; 导师: Dr. Eli Tilevich

2008–2011 北京林业大学 (BJFU)

硕士, 计算机软件与理论

2004–2008 北京林业大学 (BJFU)

本科, 计算机科学与技术

## 研究方向/兴趣

**软件工程&程序设计语言:** 软件测试, 程序理解, 代码重构 (基于编译器)

**安全&隐私保护:** 缺陷/漏洞分析, 程序关键信息保护

**移动计算&边缘计算:** 移动平台的可信计算方法, 无服务架构

## 工作经历

2021至今 讲师, 北京工业大学

- **课题-程序设计语言:** 深入探究unsafe代码在Rust程序中的应用与测试现状 (目标会议 ICSE'23)

2016-2021 研究助理, 弗吉尼亚理工大学

- **课题1-程序理解:** 通过设计和开发程序分析和语言层面的支持, 实现程序变量的语义推测 (成果发表在 GPCE'20)
- **课题2-关键程序保护:** 通过研发编译器模块及程序语言, 实现自动化隔离关键程序代码和数据 (成果发表在 ManLang'17, GPCE'18, COLA, TrustCom'20, JSS)
- **课题3-移动计算中的安全及隐私:** 通过设计安全中间件, 实现组件间通信的安全与隐私保护机制 (成果发表在 SecureComm'21, MobiCASE'21)

2011-2014 软件研发工程师, 核心软件 / 平台研发部, Sony移动通信公司

- 开发/维护Android平台多媒体传输协议和Android系统级应用
- 面试/指导新入职员工
- 与东京/隆德开发部合作进行新功能开发和代码审核
- 与谷歌和高通合作完善Android系统

## 科研服务

- 会议发行主席: ManLang'18
- 审稿人: VTC'17, 19
- 副审稿人: ECOOP'20, Journal of Computers & Security

## 认证

移动开发工程师, 工信部, 中国

## 其它

热爱中国古典诗词, 并有一定的水准

我的一首词:

[西江月] 长畏荆棘满路, 安能笑傲江湖。一书一剑展雄图, 燕然一鞭直度。虽千万人吾往, 董道不负心初。浩气不与世沉浮, 枕戈静待箫鼓。

除中文(母语), 英文(专业级)之外, 我还会说法语和日语(初级)

## 论文发表情况

[JSS'22] Yin Liu, Siddharth Dhar, and Eli Tilevich, "Only Pay for What You Need: Detecting and Removing Unnecessary TEE-Based Code," Journal of Systems & Software, In Print, February 2022 [SCI-期刊, CCF-B].

[MobiCASE'21] Yin Liu, Breno Dantas Cruz, and Eli Tilevich, "Privacy-Preserving Sharing of Mobile Sensor Data," Proceedings of EAI MobiCASE 2021 - 12th EAI International Conference on Mobile Computing, Applications and Services 2021, November 2021 [EI-会议].

[SecureComm'21] Yin Liu, Breno Dantas Cruz, and Eli Tilevich, "HTPD: Secure and Flexible Message-Based Communication for Mobile Apps," Proceedings of the 17th EAI International Conference on Security and Privacy in Communication Networks, September 2021 [EI-会议, CCF-C].

[TrustCom'20] Yin Liu, and Eli Tilevich, "Reducing the Price of Protection: Identifying and Migrating Non-Sensitive Code in TEE," Proceedings of the The 19th IEEE International Conference on Trust, Security and Privacy in Computing and Communications, December 2020 [EI会议, CCF-C].

[GPCE'20] Yin Liu, and Eli Tilevich, "VarSem: Declarative Expression and Automated Inference of Variable Usage Semantics", "Proceedings of the 19th International Conference on Generative Programming: Concepts & Experience (GPCE 2020), November 2020 [EI会议, CORE-B].

[COLA'20] Yin Liu, Kijin An, and Eli Tilevich, "Automated Refactoring for Different Trusted Execution Environments under Real-Time Constraints," Journal of Computer Languages (COLA) [SCI 期刊] 年度最佳论文提名奖.

[GPCE'18] Yin Liu, Kijin An, and Eli Tilevich, "RT-Trust: Automated Refactoring for Trusted Execution Under Real-Time Constraints," Proceedings of the 17th International Conference on Generative Programming: Concepts & Experience (GPCE 2018), November 2018 [EI会议, CORE-B].

[ManLang'17] Yin Liu, Zheng Song, and Eli Tilevich, "Querying Invisible Objects: Supporting Data-Driven, Privacy-Preserving Distributed Applications," Proceedings of the 14th International Conference on Managed Languages & Runtimes (ManLang 2017, formerly PPPJ), September 2017 [EI会议, CORE-C].

## 科研项目经验

[主要负责人] 资助单位-安全与软件工程研究中心 (S2ERC), 课题方向-代码重构, 2017

[主要负责人] 资助单位-思科公司 (Cisco, Inc.), 课题方向-移动/边缘计算中的隐私保护, 2018

[子课题主要负责人] 资助单位-美国国家自然科学基金 (NSF), 项目名称-Perpetuum Mobile: Orchestrating the Provisioning of Pervasive Resources for Emerging Mobile Applications, 2017~2021

[子课题主要负责人] 资助单位-美国国家自然科学基金 (NSF), 项目名称-Security and Software Engineering Research Center (S2ERC) at Virginia Tech, 2017~2020

## 指导经验

2021至今 指导1人(本科)的毕业设计论文, 北京工业大学

2020至今 指导2人(硕士)的科研项目及毕业论文, 弗吉尼亚理工大学

2016-2020 指导3人(本科)的科研项目, 弗吉尼亚理工大学

2010-2011 指导1人(本科)的毕业设计论文, 北京林业大学

## 获奖情况

BitShares 奖学金, 弗吉尼亚理工大学, 2019

知识产权发明奖(两次), Sony, 2014

最佳同事奖, Sony, 2012

学业一等奖学金, 北京林业大学, 2010

学业二等奖学金, 北京林业大学, 2007

学业三等奖学金, 北京林业大学, 2005, 2006

征文比赛奖, 中国青年报·中青在线, 2006

# Yin Liu

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(+86)13552798991 <https://sites.google.com/vt.edu/yinl>

## EDUCATION

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<b>Ph.D. Computer Science</b> <i>Virginia Tech, USA</i> Advisor: Dr. Eli Tilevich Dissertation: Software Tools for Understanding, Securing, and Interacting with Sensitive Program Information	2016-2021
<b>M.S. Computer Software and Theory</b> <i>Beijing Forestry University, China</i>	2008-2011
<b>B.S. Computer Science and Technology</b> <i>Beijing Forestry University, China</i>	2004-2008

## RESEARCH INTERESTS

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I am working at the intersection of *Software Engineering* and *System Security*, using innovative ideas and techniques in programming languages, program analysis, trusted execution, and machine learning to solve software engineering and security problems.

- **Software Engineering & Programming Languages:** program comprehension; code refactoring (compiler-based solution)
- **Security & Privacy:** vulnerabilities in mobile systems; differential privacy; critical program information protection
- **Mobile & Edge Computing:** trusted execution embedded mobile platform; serverless framework

## PROFESSIONAL EXPERIENCES

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<b>Lecturer (tenure-track)</b> <i>Beijing University of Technology</i> <ul style="list-style-type: none"><li>• Programming language: Studying unsafe code in Rust program.</li></ul>	2021-present
<b>Graduate Research Assistant</b> <i>Virginia Tech</i> <ul style="list-style-type: none"><li>• Program comprehension: Designing program analysis and programming support for inferring the usage semantics of program constructs (published on GPCE'20).</li><li>• Critical code protection: Developing powerful programming tools to automatically isolate critical code (published on ManLang'17, GPCE'18, COLA'20, TrustCom'20, JSS'22).</li><li>• Security/Privacy in mobile computing: Securing inter-component communications (published on SecureComm'21, MobiCASE'21).</li></ul>	2016-2021
<b>Software Engineer (full-time), Sony Mobile Communications</b> <i>Core Software / Platform Department, Sony Mobile Communications</i> <ul style="list-style-type: none"><li>• Developed &amp; Maintained Android's Media Transfer Protocol and system-level applications.</li><li>• Mentored new colleagues</li><li>• Cooperated with Lund/Tokyo sites on feature development and code review</li><li>• Delivered contributions to Google and Qualcomm, drafted technique articles</li></ul>	2011-2014

## TEACHING EXPERIENCES

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<b>Teaching Assistant, CS 1054: Introduction to Programming in Java</b> <i>Virginia Tech</i> <ul style="list-style-type: none"><li>• Taught and administered two lab sections (~50 students), held three hours of office hours per week</li></ul>	2016
<b>Teaching Assistant, Software Engineering</b> <i>Beijing Forestry University</i> <ul style="list-style-type: none"><li>• Tutored assignments and experiments (~35 students)</li></ul>	2010
<b>Teaching Assistant, OOP Language</b> <i>Beijing Forestry University</i> <ul style="list-style-type: none"><li>• Tutored assignments and experiments (~70 students)</li></ul>	2009

## RESEARCH MENTORING

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Mentored an undergraduate at Beijing University of Technology	2021-present
Mentored two graduate students (MSc) at Virginia Tech	2020-present
Mentored three undergraduate students at Virginia Tech	2016-2021
Mentored an undergraduate at Beijing Forestry University	2010-2011

## PUBLICATIONS

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[JSS'22] Yin Liu, Siddharth Dhar, and Eli Tilevich, "Only Pay for What You Need: Detecting and Removing Unnecessary TEE-Based Code," Journal of Systems & Software, In Print, February 2022 [SCI-Journal, CCF-B].

[MobiCASE'21] Yin Liu, Breno Dantas Cruz, and Eli Tilevich, "Privacy-Preserving Sharing of Mobile Sensor Data," Proceedings of EAI MobiCASE 2021 - 12th EAI International Conference on Mobile Computing, Applications and Services 2021, November 2021 [EI-Conference].

[SecureComm'21] Yin Liu, Breno Dantas Cruz, and Eli Tilevich, "HTPD: Secure and Flexible Message-Based Communication for Mobile Apps," Proceedings of the 17th EAI International Conference on Security and Privacy in Communication Networks, September 2021 [EI-Conference, CCF-C].

[TrustCom'20] Yin Liu, and Eli Tilevich, "Reducing the Price of Protection: Identifying and Migrating Non-Sensitive Code in TEE", Proceedings of the 19th IEEE International Conference on Trust, Security and Privacy in Computing and Communications (TrustCom), December 2020 [EI-Conference, CCF-C].

[GPCE'20] Yin Liu, and Eli Tilevich, "VarSem: Declarative Expression and Automated Inference of Variable Usage Semantics", Proceedings of the 19th International Conference on Generative Programming: Concepts & Experience (GPCE), November 2020 [EI-Conference, CORE-B].

[COLA'19] Yin Liu, Kijin An, and Eli Tilevich, "Automated Refactoring for Different Trusted Execution Environments under Real-Time Constraints", Journal of Computer Languages (COLA), 2019 [SCI-Journal] **Best Paper Runner-up**.

[GPCE'18] Yin Liu, Kijin An, and Eli Tilevich, "RT-Trust: Automated Refactoring for Trusted Execution Under Real-Time Constraints", Proceedings of the 17th International Conference on Generative Programming: Concepts & Experience (GPCE), November 2018 [EI-Conference, CORE-B].

[ManLang'17] Yin Liu, Zheng Song, and Eli Tilevich, "Querying Invisible Objects: Supporting Data-Driven, Privacy-Preserving Distributed Applications", Proceedings of the 14th International Conference on Managed Languages & Runtimes (ManLang, formerly PPPJ, now called MPLR), September 2017 [EI-Conference, CORE-C].

## POSTERS

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Yin Liu, and Eli Tilevich, A Programming Framework for Data-Intensive, Privacy-Preserving Applications, 16th Semiannual Security & Software Engineering Research Center (S2ERC) showcase, November 8-9, 2017.

Yin Liu, and Eli Tilevich, Compiler Tools for Critical Program Information Protection, 15th Semiannual Security & Software Engineering Research Center (S2ERC) showcase, May 24-25, 2017.

## PROPOSALS

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Topic: Program Refactoring,	Semiannual Security & Software Engineering Research Center (S2ERC),	2017 (granted)
Topic: Privacy in Mobile/Edge Computing,	Cisco Systems, Inc.,	2018 (granted)

## RESEARCH SERVICES

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Proceedings Chair,	the 15th International Conference on Managed Languages & Runtimes (ManLang'18),	2018
Reviewer/ Sub-Reviewer:	ECOOP'20, Journal of Computers & Security, VTC'17, VTC'19	2016-2020

## INVITED TALKS

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Research Method of Computer Science (focus on Software Engineering)	2020
<i>School of Information Science and Technology, Beijing Forestry University</i>	

## CERTIFICATION

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Mobile Development Engineer, *Ministry of Industry and Information Technology of PRC*

## HONORS & AWARDS

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BitShares Graduate Fellowship, <i>Virginia Tech</i>	2019
Intellectual Property Rights Inventor Award (Twice), <i>Sony Mobile Communication</i>	2014
The Best Colleague and Most Friendly Developer, <i>Sony Mobile Communication</i>	2012
College Academic Scholarship, First-Class, <i>Beijing Forestry University</i>	2010
College Academic Scholarship, Second-Class, <i>Beijing Forestry University</i>	2007
College Academic Scholarship, Third-Class, <i>Beijing Forestry University</i>	2005, 2006
Essay Competition Prize, <i>China Youth Online</i>	2006

## COPYRIGHTS

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<u><b>Yin Liu</b></u> , Lock or wake up the phone by shaking, Computer Software Copyright, <i>National Copyright Administration of PRC</i>
<u><b>Yin Liu</b></u> , Desktop management system based on Policy, Computer Software Copyright, <i>National Copyright Administration of PRC</i>
<u><b>Yin Liu</b></u> , Map building system in unknown environment, Computer Software Copyright, <i>National Copyright Administration of PRC</i>

## OTHER EDUCATION

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<b>English Presentation Trainee</b>	2016
<i>Virginia Tech</i>	
<b>Academic Writing Trainee</b>	2016
<i>Virginia Tech</i>	
<b>English Writing Trainee</b>	2014-2015
<i>University of California, USA</i>	
<b>Language Trainee</b> (English as a Second Language)	2014-2015
<i>Davis Adult and Community Education, USA</i>	

## MEMBERSHIPS

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Member, Association for Computing Machinery (ACM)  
Member, China Computer Federation (CCF)

## MISC.

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- **I am also proficient in Classical Chinese Poetry**  
One of my Poems:  
[西江月] 长畏荆棘满路，安能笑傲江湖。一书一剑展雄图，燕然一鞭直度。虽千万人吾往，董道不负心初。  
浩气不与世沉浮，枕戈静待箫鼓。
  - **Besides Chinese (native) and English (professional level), I can speak French and Japanese (beginner's level)**

## REFERENCES

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Dr. Eli Tilevich. *Professor, Virginia Tech*  
Dr. Shigeru Chiba. *Professor, The University of Tokyo*  
Dr. Na Meng. *Assistant Professor, Virginia Tech*  
Dr. Francisco Servant. *Assistant Professor, Virginia Tech*  
Dr. Muhammad Ali Gulzar. *Assistant Professor, Virginia Tech*  
Dr. Zheng Song. *Assistant Professor, University of Michigan--Dearborn*  
Dr. Peeratham Techapalokul. *Lecturer (tenure-track), Rajamangala University of Technology Lanna*