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| Pegasus%20-%20Black%20on%20White | | | | Department of Electrical Engineering & Computer Science, CS Division  College of Engineering & Computer Science  University of Central Florida | | | | | | |
| *Return Form to*: Dr. Mark Heinrich, heinrich@cs.ucf.edu | | | | | | |
| **COP 4934: Computer Science Senior Design** | | | | | | |
| **Proposed Project Description Form\*** | | | | | | | | | | |
| (Sponsors who are willing and able are asked to provide a Team Donation of $1500 or more for supplies and the running of the CS Senior Design Program) | | | | | | | | | | |
| Will support: All experimental equipment and testing platforms Cannot support: | | | | | | | | | | |
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| Sponsoring Organization: | | | | | | Security in Silicon Lab at UCF | | | | |
|  | | | | | | | | | | |
| Mailing Address: | | | HEC 239 | | | | | | | |
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| Project Contact: | | Dr. Shaojie Zhang and Dr. Yier Jin | | | | | | Position: | | Assistant Professor |
|  | | | | | | | | | | |
| Contact Phone: | 407-823-5321 | | | | | | Fax: | | 407-823-5835 | |
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| Contact E-mail: | yier.jin@eecs.ucf.edu | | | | | | | | | |
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| Project Title *(working)*: | | | | | Smart Device Security Identification | | | | | |

*Please feel free to use as much space as needed for each of the sections below.*

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| **Background of Company/Organization**  (Provide a brief overview of the company/organization and the specific project location here) |
| The Security in Silicon Lab (SSL) is one of the hardware security / cybersecurity research labs at the EECS Department. This lab identified the security vulnerabilities on a Google Nest Learning Thermostat which was presented on Black Hat. |
| **Statement and Scope of the Problem(s)**  (Provide the problem statement here; Please be as specific as possible to help us understand the scope of the problem, and thus the scope of the project, specifically the design content) |
| Smart devices have been widely used in our daily life and it is predicted that there will be more than 20 billion networked devices by 2020. However, previous research have already found out that most of the smart devices do not take security into consideration which put personal information in jeopardy. |
| **Overall Project Goal(s)**  (Describe the overall goals of the project in this space) |
| Through this project, several smart devices will be selected as our target platform so that we can check the device level protection countering malicious attacks. Our analysis will focus both on software level and hardware level so that security vulnerabilities will be caught through our work. We will also demonstrate the methods on how to compromise the devices through the identified backdoors. Meanwhile, possible solutions will also be developed to secure these networked devices. |
| **Project Objectives**  (Enter the project objectives that will help achieve the goals of the project; Please be as specific as possible) |
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| **Expected Project Deliverables**  (Enter the expected project deliverables including, if possible, proposed project tasks; Please be as specific as possible) |
| The project deliverables fall in two groups: 1) the identified backdoors in commercial smart devices; 2) the possible solutions to secure these devices. All identified backdoors will be reported to the manufacturers before they are released to public. If time permits, prototypes may be developed to demonstrate the effectiveness of the proposed security solutions. |
| **Desired Core Competencies and Experience of Team**  (Please list the desired competencies/experience/knowledge needed by the project team members that you feel will facilitate successful project execution; Examples: specific programming language experience, familiarity or expertise in certain web technologies, databases, mobile SDKs, prior classes in certain subject areas, a love of computational complexity and efficient algorithms etc.) |
| All group members should be aware of the computer architecture and are good at reverse engineering kernel code to recover the program functionality. Students are also required to be familiar with C/C++ and assembly programming. |
| **Other Special Considerations and Project Requirements**  (Please provide any special circumstances, constraints, and requirements needed by the project team members; **Examples**:   * University participants must be US Citizens or Permanent Residents, * All work is to be performed off-campus at a specific site, * *Interdisciplinary project*: You would like to see CS students teamed with engineering students from one or more of: Computer Engineering, Electrical Engineering, Mechanical Engineering, Industrial Engineering, Civil and Environmental Engineering (please specify) * All team members and the professor must submit to background checks, * All team members and the professor must sign non-disclosure agreements |
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| **Project Mentor(s), if different than who is listed above**  (Please provide the contact information and title/position for the project mentor(s), who will advise the student team) |
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*\*IMPORTANT NOTE: Proposed projects may not be chosen by student groups. In any one semester the number of potential industry-sponsored, faculty-proposed, or student-funded projects may exceed the number of student teams. If this project proposal is approved by Dr. Heinrich as a potential CS Senior Design project, you or an appropriate representative will be asked to come to class and give a 15-minute project pitch to the students. Keep in mind this is your chance to convince the students why they should pick your proposed project. Think about what is in it for them, what technologies they will get exposed to, what are the broader, enduring, and social impacts of the work, etc. If your project is chosen, you will be notified typically by the 4th week of the semester. If your project is not chosen, you will be notified in the same timeframe and if it makes sense for your timeline, we would love to offer the same project in the next semester.*