

COMP-6961

Seminar Abstract: Self-Adapting Data Intensive
Workflow Orchestration and Processing Over Cloud
Environment

Presented by:

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Written by:

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November 19, 2018



Abstract

Cloud computing era needs flexible resources based on flow of the data from many different data streams like Facebook, Twitter, Forums, etc. To keep the system work smoothly with big amount of data flow, needs a sophisticated framework and wise-decision-making. There are multiple models explained in the talk, for decision making and reconfiguration. However, proposed framework by speaker(Dr. H. T. Kassabi) is based on automatic system adaption and reconfiguration depends on combination of monitoring and prediction adaption models to avoid degradation in QoS. Trust model is used as a metric to measure or monitor the QoS. Speaker also discussed about time series algorithm(ARIMA) used for statistical forecasting for predicting adaption. **Trust value is calculated using different parameters like availability, reliability, turnaround efficiency, data integrity, etc.** Proposed model(By Speaker), contains, different agents having different responsibility to balance the trust. These agents behave as per the monitoring algorithm's outcome and make the decision firm by getting confidence from prediction algorithm's outcome. Interesting part is, what happen if these algorithms give completely conflicting results? what decision a resource agent should take? As per the speaker, in above scenario, the decision will be made based on previous decision and current monitoring results. This approach is not proved on the big scale yet, however, this technique of orchestration seems to be very useful in cloud resource automatic reconfiguration and it will make cloud more elastic and responsive toward dynamic work-flow changes.

COMP-6961

Seminar Abstract: A Cryptographic Approach to
Non-Local Interaction

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November 22, 2018



Abstract

”An interactive proof system is an abstract machine that models computation as the exchange of messages between two parties. The parties, the verifier and the prover”. [Wikipedia]

Concept in Computational complexity theory and applicability in cryptography. Interactive proof systems works on message passing to convince verifier that the prover is who he/she said he/she is with certain level of soundness(based on probability) and completeness(Based on truthfulness of statement). Zero-Knowledge proof, Data resources can be very sensitive to share from verifier to provers, in such case, how to authenticate prover without reviling the sensitive data or computational resource of verifier? The concept of zero-knowledge can solve this problem without reveling resources. Speaker, discuss about this two concepts mentioned above in multi-prover environment and he display his researched model on multi-prover interactive proof and discover the problems when its done by sharing non-local resources to multiple provers and in non-local environment, how it can give different results for same input. In standard MIP model, the verifiers is not local and this non-local tie-up can help provers to breaks the faithfullness. one of many scenario was PR-Box, where provers can't talk(no signaling allowed at all), the chances of verifiers to win is 75%, However, its entangled to upto 85%. Speaker, represent a generalized MIP(Multi-prover Interactive Proof) model, which take care of provers and verifiers non-local tie-up, which automatically results into non-local multi-prover zero knowledge. Moving from old statndard MIP to new model(presented by speaker), does not loose any power, rather it gives power to eliminate potential contamination possibly because of signaling between provers.

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Seminar Abstract: The IoT Fragmentation, Issues and
Opportunities in Software Engineering Research

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November 30, 2018



Abstract

IoT(Internet of Things) is about to connect every single item of our daily life through internet and you will be able to access, monitor and control from anywhere. Dr. Guhneue mentioned, its curse, worse and life threatening when these daily-life devices are connected and **vulnerable**. It was mentioned, that the problems(Productivity-¿quality) industry has faced during the early days of software evolution is the most relatable for the problems industry are facing with IoT these days. Main cause of vulnerability is cross platform compatibility issues, time-to-market pressure and competitive nature of many companies which are not focusing on this life threatening issue which can cause severe damage in many other way. One of the survey by Cisco, reveals that 3/4 of IoT devices are failing and JEEP on the highway is one of the example of how severe it can be!. To deal with productivity-¿quality issue, a common collaborative ecosystem is needed and that is possible by either a common software on all hardware or to transform the software to run everywhere. Dr. Guhneue discussed a concept of software miniaturization and fragmentation to run the software on different hardware. In the same context, MoMIT, is a program which gives different variants of code and then match the hardware configuration including CPU time, memory and ROM to choose the right variant to run. However, it seems that the chosen variant wont be perfect-fit for all the time and always need some level of manual human input in choosing right variant from all feasible ones. It is convincing that effort toward this approach of fragmentation may make a big difference in future IoT devices.

COMP-6961

Seminar Abstract: Computer Vision of Refractive
Media

Presented by:

Dr. Herbert Yang

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December 17, 2018



Abstract

There are plethora of research work done on normal objects under normal light with no distortion in channel by taking help from basic laws of light-waves. However, it seems the research on reconstruction of object under 3 dimensional space has not captured much focus and there are multiple researchers who have tried to apply the ground based methods on the objects under water and it doesn't seems like it succeeded much. As Dr. Yang discussed, there are multiple parameters that affects the outcome of the technique, But, it seems that refraction of light because of change in media is major concern and the result of the experiments shown in seminar compliments this claim. Dr. Yang also discussed how they tackle challenges one after other. More challenging part of the research seems like when a light wave refract under water within the same medium and it is not same as it refract from air to water or air to air is align, when a light wave refract underwater, its curved wave to deal with and reconstructing a model from these kind of wave is not easy. There are some cameras which can deal with this refractive effect in air, However, underwater refraction has to be deal with some other mechanism. Dr. Yang discussed, how to find the original point of light of refracted signal using dispersion and its also not so accurate as the dispersion also depends on the wavelength of signal. As a result of these challenges and experiments, they have made light-box to get the dispersion ratio and using that results, cameras can be calibrated and also lances can be adjust accordingly. Moreover, after calibrating the cameras and lances there are more challenges like water current underwater which can easily distort the calibrated setup in a second. The only solution left was self calibrated platform which they did and succeeded up to acceptable level of results. Reconstruction of 3D model from this setup was not as easy as it seems, for a normal object, it gives really minor noise in results. When it comes to transparent object to reconstruct in 3D, it does affected by many parameters(including nature of object) and after some experiments, the results says that for different natured object(Prism, Crystal sphere, etc..) there are different variation in technique.