Poster Presentations

Guidelines

Keep the material simple

- Make full use of the space, but do not cramp a page full of information – it could look messy

- Be selective when showing results – present only the main facts

Use colours sparingly and with taste

- Colours should be used only to emphasise and to add interest
- Avoid bright colours, ie bright pink, bright yellow, bright green, etc
- Pastel shades convey feelings of calm
- Bright colours conjure an image of conflict and disharmony

Background colours

- Use background and foreground colours that complement each other

- It's best to keep the background light – dark background will cost more to print and is harder to read

- Avoid gradient fills – they can look tatty when printed

Fonts

➡ Too many font types distract, especially when they appear on the same sentence

➡ Use fonts that are easy on the eye

   ➡ This is Times Roman

   ➡ This is Arial

Fonts

- Headings should appear larger than the other text, but not too large

- Do not use all UPPER CASE type – makes it difficult to read

WHAT DO YOU THINK OF THIS LINE WHERE ALL THE CHARACTERS ARE IN UPPER CASE?

What do you think of this line, where only the first character of the first word is in upper case?

Fonts

■ Do not use a different font type to highlight important points – it loses the fluency and flow of the sentence.

In this sentence, I want to **emphasise** the word 'emphasise'

In this sentence, I want to **emphasise** the word 'emphasise'

Spelling

- There is nothing more amusing or annoying than spelling mistakes
  - It gives the impression that you are:
    - Careless
    - Not bothered
    - Not worthy of a high assessment mark

Common Errors

Incorrect	Correct
Please except the gift	Please accept this gift
He's alright after his fall	He's all right after his fall
He refused to take my advise	He refused to take my advice
Put the bag back in it's place	Put the bag back in its place
The car past the train	The car passed the train
We spent a quite evening reading	We spent a quiet evening reading

Generic Real-time Uniform K-space Sampling Method for High-speed Swept-Source Optical Coherence Tomography

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Abstract

We developed a universal, real-time uniform K-space sampling (Rt-UKSS) method for high-speed swept-source optical coherence tomography (SS-OCT). An external clock synchronized with the zero-crossing time of an interferometric calibration signal enables uniform data sampling of the OCT signal in K-space. The Rt-UKSS method is adaptive and applicable to a generic SS-OCT system of a wide range of A-scan rates without special adjustment. We successfully implemented the Rt-UKSS method in an SS-OCT system of a 40-kHz scanning rate. Real-time imaging of biological tissues was demonstrated with a measured axial resolution of 9.3 μm and detection sensitivity greater than 120dB.

Challenge and Objective

The OCT fringe signal of SS-OCT is normally nonlinear and hysteretic. Therefore, calibration/resampling prior to Fourier transform is indispensable, but it has several challenges :
- Slow down the overall data processing speed
- Require oversampling the OCT fringe signal
- Sensitive to any fluctuation in wavelength sweeping

The hardware-based Rt-UKSS method is implemented by providing point-by-point triggers with uniform K-spacing for the digitizer. This method is:
- Robust, adaptive, and applicable
- Insensitive to the instability of the swept source
- Able to handle broader spectrum bandwidth

Methods

- Requirements of hardware-based Rt-UKSS :
  - Two clock cycles with an equal K-space interval for each fringe cycle of MZI calibration signal
  - 50% duty cycle of the clock signal over a broad range of frequency required by fast ADC
  - "Dummy" clock to fill adjacent A-scans' gap
 - Minimal propagation delay and jitter time of external clock circuitry

Methods

- Steps of real-time uniform K-space sampling approach (left figure below):
  - A broadband 90° phase shifter to generate a quadrant signal from the original calibration signal
  - High-speed comparators to produce two zero-crossing signals from original and quadrant signals
  - Exclusive OR gate to combine two zero-crossing signals
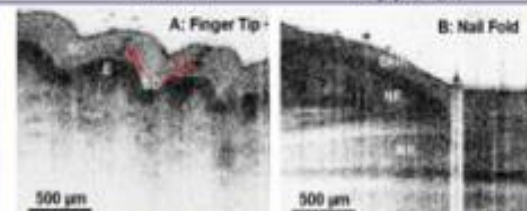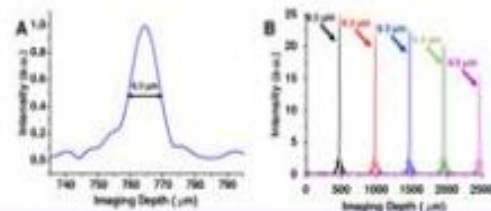 - Dummy clock signal generator to fill up the idle gap
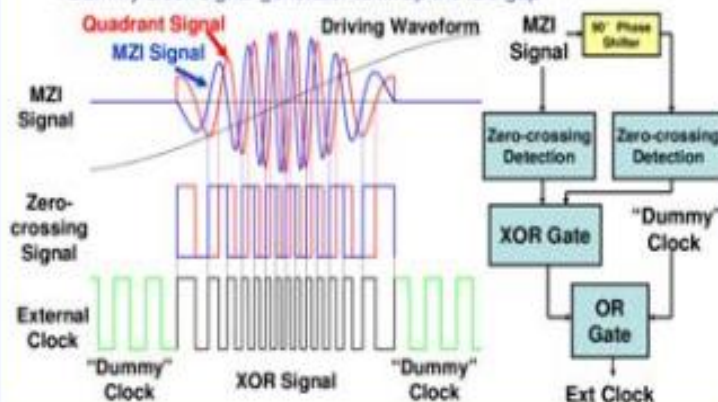
Results

- Experimental results of the external clock signal (right figure above) :
  - Duty ratio of the external clock over the entire A-scan is close to 50%
  - The frequency change of the MZI signal covers more than one octave
  - The trigger frequency changes from 50 to 110 MHz for each A-scan
  - The circuitry currently works properly for 20 to 100 kHz A-scan rate
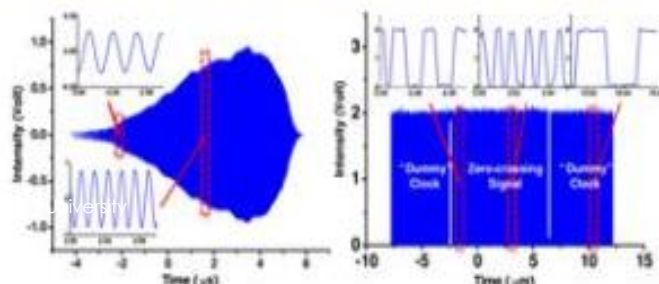
Results

- Rt-UKSS method is implemented in an SS-OCT system with a 40kHz FDML at λ_0=1300nm.
- Comparison between real-time linear K-space sampling and numerical calibration:

	Numerical Calibration	Linear K Sampling
Acquired number of data points per A-line	2048	918
Calibrated data points number per A-line	680-790	918
Axial resolution (in air)	~ 10.2 μm	~ 9.3 μm
Data processing speed	~50,000 A-lines/sec (nearest neighbor)	~100,000 A-lines/sec (no interpolation)
Data transfer and saving requirement	~ 300 MB/sec	~ 125 MB/sec

SD: sweat duct, SC: stratum corneum, E: epidermis, NF: nail fold, and NR: nail root

Conclusion

Rt-UKSS method for a high-speed SS-OCT system with an A-scan rate 20-100 kHz was developed. This method is relatively easy to implement and reduces demand in the speed of digitization, data transfer, processing and real-time saving. It also affords a broader wavelength scanning range for better axial resolution.

Acknowledgement and Reference

[1] J. Xi, L. Huo, J. Li, and X. D. Li, "Generic Real-time Uniform K-space Sampling Method for High-speed Swept Source Optical Coherence Tomography," Optics Express, Accepted.

Reducing High-Risk Hospital Readmissions
MD24HouseCall

MD24 House Call — PERSONALIZED MEDICAL CARE

Phone: (623)374-7774
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www.md24housecall.com

SURVEY OF DISCHARGED ELDERLY PATIENTS WITH LESS THAN 5% TOTAL READMISSIONS WHILE UNDER HOUSE CALL PHYSICIAN CARE

INTRODUCTION

Reduction of 30-day post discharge hospital readmissions or emergency department (ED) visit rates to less than 5% in high-risk elderly medical patients in independent and assisted living facilities with house call visits and in-home chronic care management via MD24 technology platform.

Many hospital admissions are due to uncoordinated, inappropriate medical treatment and the discharge of fragile elderly patients with a high risk of of readmission. This survey aimed to assess whether a follow-up program undertaken by house call physicians and nurse practitioners could improve the quality of medical treatment and reduce the risk of readmission of elderly newly discharged patients residing in senior communities.

Baby Boomers have begun turning 65 and qualifying for Medicare — one every eight seconds.
A record 2.8 million qualified in 2011, rising to 4.2 million a year by 2030. In all, an expected 76 million Boomers will age on to Medicare. Even factoring in deaths over that period, the program will grow from 47 million today to 80 million in 2030. At the same time, health care costs are projected to outpace inflation; medical advances will extend lives, straining the program's finances. It's expected to cost $929 billion by 2020, an 80% increase over 10 years.

In 2010, Arizona's hospitals provided about $412 million in uncompensated care, which is composed of charity care and bad debt. Those costs are expected to increase between $217 million and $274 million over the next 12 months -- a 61 percent to 67 percent increase from 2010.

Within two years of the MD24 Technology Platform's launch, we are in 170 facilities taking care of 2,600 fragile elderly patients.

READMISSION RATE: ARIZONA

2007 - 2010

- Arizona
- National 80th Percentile
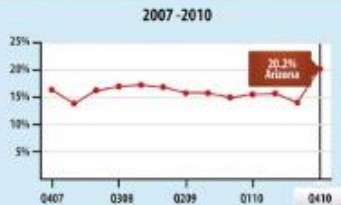
DESCRIPTION

Current Rationale
Top 5% costliest Medicare beneficiaries are 50% of Medicare expenses
Can be identified based on hospitalizations, home health needs, ADL impairments, diagnoses
Don't fit easily into traditional office flow

3 million Medicare beneficiaries cannot easily access physician offices and therefore lack optimal 1° care

What is a Modern House-Call Practice?
A Self Sufficient practice that is virtual as a local network and dedicated to caring for chronically ill Medicare and Medicaid homebound patients.

What is a virtual medical office?
A network allowing multiple users in different locations to remotely perform the following tasks at least as efficiently as if they were in the same physical location.
A physician executive from any location in the USA with a valid state license can sign up, train in 1 day and be ready to care for patients in less than 1 week at a higher reimbursement rate.
Concurrent use of the EHR platform with live communication
Ability to receive, sign and resend faxes
Integrated phone system (VOIP)
Patient scheduling
Billing and practice management software

Elements of a virtual office:
Secure access
Redundant and backed up
Computerized database storing patient data via qualified (EHR)
Capable of exchanging information with multiple remote users
Processing faxes
Scheduling patients
Communication
Billing

What MD24 provides:
Primary Care/Urgent Care/Transitional Care
Palliative Care
Medication Management
Wound Care
Chronic Care Coordination & Management
Dementia Care
Hospice and Home health Oversight
In Home Testing (Labs, X-rays, Ultrasounds, ABI, EKG, ECHO)
Specialty Services (i.e. Podiatry, Physical Therapy, Psychiatry, etc.)

Causes of Hospital Readmissions for Heart Failure
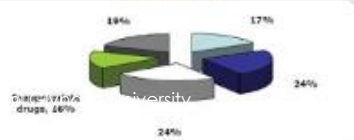
Vinson J et al. J Am Geriatr Soc. 1990;38:1290

OUTCOMES

Provides access to care for pts that do not "fit" into conventional 1° care office and identify problems often missed in office:
EtOH-ism
Incontinence
Early caregiver burnout
Triggers for falls
Social support issues
ADL impairments
Better medication reconciliation
Generally more "team oriented" than 1° care

VA Home Visit Study:
66% men; 47% dependent for at least 2 ADLs; mean 6 chronic conditions inc 1/3rd with dementia, 3/4th with heart disease
Interdisciplinary team approach including physician, nurse, PT, home health

Outcomes pre/post enrollment:
62% fewer in patient bed days
88% fewer NH bed days
Cost savings, 24% ($38K to $29K per person per year)

21% reduction in 30 day readmissions
28% fewer admissions, 79% fewer in pt days = much shorter stays

Cost Effectiveness:
- The Virginia Commonwealth Medical Center house-calls program (23 yrs): 60% ↓ hospital costs.
- The Call Doctor Medical Group, San Diego (25 yrs):
- $1075 per capita savings
- Geriatric Care of Nevada (8 yrs): $750 per capita savings
- The Montefiore Health System House Call program,
- Bronx NY (5 yrs): 33% ↓ total costs
- NP led intervention, average 4.5 home visits in 4 weeks post hospitalization: total costs reduced by half

Hospital Utilizations:
- The Call Doctor Medical Group, San Diego (25 yrs): 59% ↓ ER visits
- The GRACE House Calls program, Indianapolis (5 years): 50% ↓ ER visits; 43% ↓ hospitalizations
- The Home Physicians program, Chicago (15 yrs): 35-60% ↓ hospitalizations
- The Montefiore House Call program, Bronx, NY (5 yrs): 42% ↓ hospitalizations
- Mount Sinai Visiting Doctors, New York City (14 yrs): 86% ↓ hospitalizations
- Geriatric Care of Nevada house call program (8 years): 27% ↓ hospitalizations
- The House Call program, Washington Hospital Center, Washington, DC (10 yrs): 28% ↓ inpatient LOS and 75% ↓ hospitalizations at end of life.
- 4 weeks post discharge NP led intervention, average 4.5 home visits: readmissions reduced by half (Naylor et al, JAGS 2004)
- Mt Sinai NP transition program within Home Visit Program: improved communication and satisfaction, but did NOT decrease LOS/readmission rate

MD24: The Proven Model with Physicians as Central Point of Disease Management

2010 Readmission Rate
Natl Average 27%
MD24 < 3%

2011 Current Readmission Rate
Natl Average 25.9%
MD24 0.54%

2011 Current Initial Hospitalization Rate of Patients Over Age of 65.
Natl Average 24.9%

MD24 6%
MD24 has 2,600 patients; based on 46 initial hospitalizations per quarter

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CONCLUSIONS

IMPROVEMENT STRATEGY - MEASURABLE RESULTS

Medicare Reimbursement
Increased Referrals

MD24 Proven Model
Continuity of Care
Patient Pending Platform
30-day Post Discharge Program

Improved Patient Health
And Performance Reports

Physician house call services were delivered to high-risk elderly inpatients to decrease unplanned acute health care utilization up to 30 days following discharge.

Fewer readmissions and better control of medication is generally strived for. The survey shows a possible framework securing the follow-up on elderly patients after discharge by reducing the readmission risk and improving medication control.

MD24HouseCall is the 1st and only company to invent a software platform specialized in physician house-call services for patients in group homes, assisted and independent living facilities. We have proven our model by creating a virtual clinic leveraging tablets and 4G LTE technology that brings physicians, specialists, lab, X-ray, and all healthcare services directly to the patient. In 2 years of exponential growth we have added over 170 facilities and 2,600 patients, without overhead expenses. Our platform manages multiple providers, locations, services and patients; generates seamless care, prevents hospital readmissions, and provides solutions to mobility issues, follow-up care, rural problems and preventative measures. We have proven lower cost for Medicare and health plans, provide optimal employment flexibility, reduce penalties and losses for hospitals, and increase patient health status and quality of life.

Vision, Mission & Market Evolution

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http://www.seniorlivingu.com/industry-statistics.html

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UrbanFlood

The Common Information Space: A Framework for Early Warning Systems

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Motivation

Early Warning Systems (EWS):
► Can be crucial for mitigating the impact of natural disasters
► Require **advanced computing ecosystem** which supports the entire EWS lifecycle: development, deployment and execution
► Combine and orchestrate **various distributed resources**: data sets, scientific apps, real-time sensor data feeds, etc.
► Involve **mission- and time-critical** scenarios based on **resource-intensive** computations

Objectives

Provide **the Common Information Space (CIS)** supporting ► **EWS development** by providing a reference EWS model and development framework ► EWS deployment through the novel concept of EWS-factory-as-a-service. ► **EWS execution** by providing a runtime infrastructure for resource allocation, self-healing, mission- and time-critical operation, and urgent computing

CIS Architecture and EWS reference model

► EWS reference model leverages SOA architectural patterns adapted for scientific computing
► Domain resources exposed as basic services, orchestrated into application scenarios and exposed as composite services, aka Parts
► Enterprise Application Integration engine used for workflow
► CIS provides runtime services for execution management (**Platin**), registry of metadata and state (**UFoReg**), dynamic resource allocation (**DyReAlla**), as well as self-monitoring (**ErlMon**) and provenance tracking
► Apps are wrapped as virtual images (appliances) and deployed in the cloud
► Dynamic resource allocation is based on on-line monitoring of performance and resource demands
► New EWS instance is started through the EWS factory service by configuring an EWS blueprint
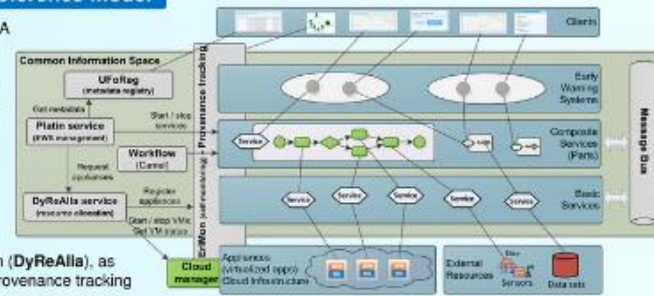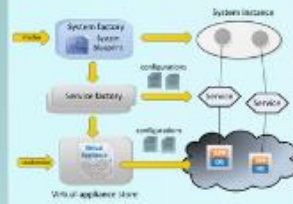
Flood EWS

► CIS-based implementation of Flood Early Warning System
► Leverages in-situ sensors for predicting flooding threat due to dike failures in urban areas
► Cascade of models for anomaly analysis, risk assessment, and impact prediciton
► Implemented in CIS technology as blueprints for application scenarios, orchestrated into an overarching EWS workflow
► Supported at runtime by CIS services
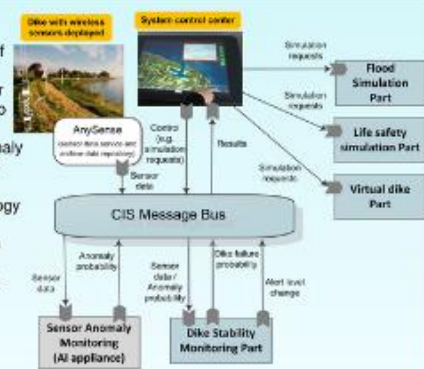
Conclusion

CIS contributes conceptually and technologically at least in the following areas:
► CIS as a **factory for Early Warning Systems**. Proven by the implementation and validation of the Flood EWS.
► CIS as a **geo-ICT technology for spatial data processing services**. CIS adopts guidelines of the INSPIRE directive and leverages OGC standards for service interfaces.
► CIS as a **runtime infrastructure** for resource-intensive mission-critical systems.

References

► B. Baliś, M. Kasztelnik, M. Bubak, T. Bartynski, T. Gubala, P. Nowakowski, J. Broekhuijsen. The UrbanFlood Common Information Space for Early Warning Systems. Procedia Computer Science, 4.98-105, 2011. Proc. of the ICCS 2011 Conference.
► B. Baliś, T. Bartynski, J. Broekhuijsen, M. Bubak, G. Dyk, T. Gubala, M. Kasztelnik R. Meijer. UrbanFlood: experiences in adopting INSPIRE guidelines for flood early warning systems. INSPIRE 2012 Conference.
► B. Baliś, T. Bartynski, M. Bubak, G. Dyk, T. Gubala, M. Kasztelnik, A Framework for Early Warning Systems. Accepted for E-Science 2012.

http://dice.cyfronet.pl/products/cis

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Biochar in southern central coastal Vietnam

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Southern central coastal Vietnam

The southern central coastal provinces of Vietnam are home to Vietnam's poorest farmers. The region is characterised by low rainfall and 500,000 ha of sandy soils developed mostly from weathered granite. Agricultural production on these soils is limited by their low water and nutrient holding capacity. Tree crops such as cashew and mango, intercropped with peanuts and cassava, are widely grown in the region. Table grapes are also produced in Ninh Thuan province.

Biochar in Vietnam

As one of the largest producers of rice Vietnam could potentially produce large volumes of biochar from rice hulls. A rice hull char product with a carbon content > 35% is already produced as a by-product of the cottage rice cake industry. The rice hull char is used by the nursery industry and the resource has potential as an amendment to improve the sandy soils of southern central Vietnam.

Two field experiments were established in early 2009 as part of an ACIAR funded project. Rice hull biochar (33% C) used in the experiments was sourced from the Phillipines.
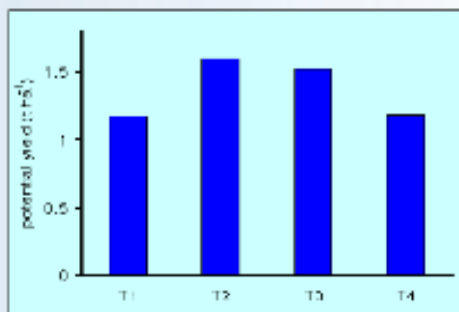
Experiment 1. Cashew. Biochar 25t ha^{-1}

T1. single bund + fertiliser (farmer practice)
T2. double bund+ biochar + fertiliser
T3. double bund + biochar + ½ rate fertiliser
T4. single bund + ½ rate fertiliser.

Experiment 2. Groundnut. Biochar 10t ha^{-1}

T1. control - no inputs
T2. manure 5t ha^{-1}
T3. NPK (30:90:60)
T4. biochar
T5. manure (5t ha^{-1}) + NPK (30:90:60)
T6. biochar manure 5t ha^{-1}
T7. biochar + NPK (30:90:60)
T8. biochar manure 5t ha^{-1} + NPK (30:90:60).

Figure 1: Experiment 1: Cashew potential yield (potential yield assessed while crop still on tree)

Results

Experiments are still in progress but preliminary data indicate a positive yield response to biochar amendments for both cashew and groundnut when used in combination with fertilisers.
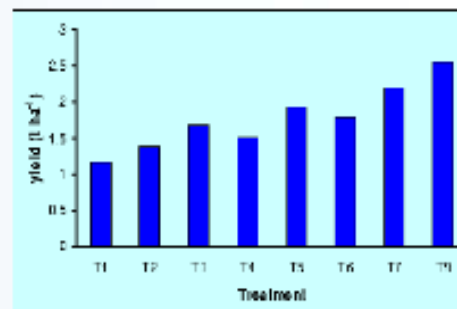

Figure 2: Experiment 2: Ground nut yield

Looking forward

Results from the first cashew crop will be ready for analysis end of June. Data will also be collected from a second cashew crop cycle to be completed in 2010. Data for the first groundnut crop is currently being analysed. The analysis will include an assessment of the impact of biochar on soil characteristics and plant nutrient uptake. A second groundnut crop will be grown during the 2009 wet season.